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Board of Natural Resources
Colstrip Hearings

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TUESDAY, JANUARY 27, 1976

The hearing reconvened at 8:40 A.M. on Tuesday, January 27, 1976 in the Chambers of the Montana House of Representatives, State Capitol, Helena, Montana.

The Honorable Carl M. Davis, Hearings Examiner, presided over the proceedings.

APPEARANCES:

Applicants:

William M. Bellingham, Esq.
John L. Peterson, Esq.
John Ross, Esq.

Department of Natural Resources and Conservation:

William G. Sheridan, Esq.
Donald MacIntyre, Esq.
Robert T. Cummins, Esq.

Northern Cheyenne Tribe, Inc.:

Peter Michael Meloy, Esq.

Northern Plains Resource Council:

Leo Graybill, Jr.

The following proceedings were had:

HEARINGS EXAMINER: Are the parties ready to proceed?

MR. BELLINGHAM: Applicants are ready.

MR. SHERIDAN: We are ready.

HEARINGS EXAMINER: You may call your next witness.

MR. BELLINGHAM: The Applicants will call Mr.

Robert S. Pettibone.

ROBERT S. PETTIBONE, called as a witness by the Applicants, having been first duly sworn upon his oath, both as to his written direct testimony and as to the oral testimony to follow, was examined and testified as follows:

MR. BELLINGHAM: We have submitted to the court reporter a written statement of testimony of Robert S. Pettibone, and at this time applicants offer into evidence Exhibits 22 and 23.

MR. SHERIDAN: I understand our previous procedure in the hearings has been to allow for cross-examination of the witness, at which time the objections could be made at the conclusion of testimony.

HEARING EXAMINER: Very well, you may proceed with your cross-examination.

(THE WRITTEN DIRECT TESTIMONY OF MR. ROBERT S. PETTIBONE WAS DIRECTED TO BE INSERTED AT THIS POINT.)

STATEMENT OF TESTIMONY OF ROBERT S. PETTIBONE

My name is Robert S. Pettibone, my business address is 8420 West Dodge Road, Omaha, Nebraska, and I am Vice President - Power for Gibbs & Hill, Inc. This firm is a general engineering firm dealing generally in the engineering, design and construction fields. Included in the firm's specialties is the engineering and design of utility power plants and many other facilities.

I was born December 14, 1919, in Lebanon, Pennsylvania, educated in the public school system of Erie, Pennsylvania, and at the University of Purdue, Lafayette, Indiana, where I received a B.S. degree in Metallurgical Engineering in February, 1947.

My professional experience has been associated with the power industry and, in particular, with the electric utility industry. Upon completing my work at the University of Purdue in 1947, I started with the Union Iron Works Company in Erie, Pennsylvania, as a junior engineer. In 1949, I joined a small power plant contractor, the W. Hawley Company of Detroit, Michigan, (no longer in existence) as a project engineer assisting in estimating and other proposal activities for work they were bidding. In 1952, I became associated with an architectural-engineering company, Boddy, Benjamin & Woodhouse Associates, Detroit, Michigan, serving industrial and utility clients in the Michigan area.

In 1957, I joined the engineering division of The Hydro-Electric Power Commission of Ontario in Toronto, Ontario, Canada, as senior mechanical engineer. This is the electric power utility serving the Province of Ontario and next to TVA is the largest electric utility in North America in terms of installed generating capacity. In effect, this was a department head position which would be equivalent to chief mechanical engineer in most other large utilities. At this time, most of the generating capacity was hydro-electric power, but having nearly utilized all of the economical hydro-generating sites by 1957, further increases in generating capability had to be by thermal (fossil fuel) or nuclear generating units. This required a substantial Mechanical Engineering Department. It was my responsibility to organize and develop this department. During the period from October, 1957, to March, 1965, this new Mechanical Engineering Department backed up with the existing Civil-Structural and Electrical Engineering Departments undertook the engineering and design of several major coal fired generating projects (totaling 4,600 megawatts) plus several nuclear generating projects (totaling 2,400 megawatts).

In 1965, I joined Gibbs & Hill, Inc. in New York as a staff consultant - responsible for a number of studies for various clients, both domestic and foreign. I was promoted to chief mechanical engineer in 1966 and to vice president and engineering manager in 1970. In late 1974, I was sent to the office of Gibbs & Hill in Omaha, Nebraska, as Vice President - Power, responsible for all engineering and design together with project management for the projects assigned to the Omaha office. The present staff in Omaha numbers about 235 and is growing at a rate which should be doubled in another 4 to 5 years.

I am a registered Professional Engineer, by examination in the state of Michigan and by reciprocity in the states of Nebraska and New Mexico and the Province of Ontario.

On February 19, 1975, Gibbs & Hill, Inc. was retained by the legal counsel for the applicants in this hearing for the purpose of advising the applicants and for the further purpose of undertaking an independent study relative to a comparison of the costs of generation of electrical power at the Colstrip site, together with associated transmission costs, with the equivalent costs at other potential but hypothetical sites.

The selection of Gibbs & Hill was based on the company's experience in power generation, transmission and transportation fields and the availability of key personnel for immediate assignment to this study. Gibbs & Hill accepted the assignment under the conditions that they would perform an independent study and that they would have access to all plant data that was required, from the applicants.

On February ?0, 1975, I traveled to Butte, Montana, to have further discussions with the applicants' counsel and members of the engineering staff of Montana Power to obtain preliminary information so that a study plan could be formulated.

Upon my return to Omaha the following engineering team was assigned to the study by Gibbs & Hill, all of the individuals being employed by Gibbs & Hill: R. S. Pettibone, Vice President Power, Omaha, Nebraska; Robert Ploss, Consulting Engineer Power, Omaha, Nebraska; Joseph Charney, Chief Engineer, Transmission, New York, New York; Oswald G. Dellacanonica, Chief Transportation Engineer, New York, New York; Robert D. Meckna, Associate Mechanical Engineer, Omaha, Nebraska; and Bruce M. Jacobs, Associate Mechanical Engineer, Omaha, Nebraska.

I became the study director and Mr. Ploss acted as the study project engineer. The first four members of the team met in Omaha to determine individual assignments prior to a second visit to Butte, Montana, where they together with Montana Power staff would hold detailed discussions as to the scope of the study and collect additional relevant data from Montana Power. Mr. Ploss would gather major plant costs, design parameters of plant pertinent to the study, economic factors, labor costs, etc. Mr. Charney would gather all transmission system data and anticipated line losses, while Mr. Dellacanonica would accumulate unit train data and the various destinations from the mine to alternative sites. I, together with Mr. Ploss, would determine the mode of analysis after having a chance to gather and preliminarily assimilate the data and hold our discussions with Montana Power.

The above noted group then visited Montana Power for a data gathering session. We met with the following Montana Power engineers who contributed data for the study: Robert Labrie, W. Blankmeyer, R. Davenport, Roger Hofacker and others of their respective staff.

A considerable quantity of information was gathered with Montana Power supplying basic or fundamental information that was required for the independent economic analysis to be developed by Gibbs & Hill. At this session, I advised Montana Power that we would perform the analysis on both a present worth and an annual cost basis, the details and results of our analysis being referred to later herein.

It was agreed with Montana Power early in our study that it would be more accurate to develop total costs of generating power at Colstrip and at two other hypothetical sites. Eventually the alternate power generation locations at Hot Springs, Montana, and Spokane, Washington, were chosen to compare with the mine-mouth alternative (Colstrip).

As pointed out before in this statement, the decision was made to perform the analysis on both a present worth and an annual cost basis. Both methods of computations are commonly used by the utility industry and have been accepted by the industry as a valid technique for developing relative economics of base and alternative schemes for the many studies they undertake. The present worth analysis is one of the most utilized schemes for studies since all future costs can be expressed as a dollar value today. Although this method is excellent for determining the best alternative, the present worth of future costs is generally a much smaller number than the total dollar spent over a great many years.

The advantage of the annual cost analysis allows for the simple computation of the average annual cost to produce a kilowatt hour of electricity. It also allows direct comparison on an annual basis of all costs for alternative schemes. The difference of total costs for each scheme over the plant life actually represents the total revenue to be paid by the consumers over this period. The differential of total costs over the plant life is quite huge compared to the present worth value particularly when the plant life is 37 years.

The annual cost analysis would consider for each site all major fixed and variable costs over the plant life. The present worth analysis would similarly show cost of owning and operating the plant but reduced to 1975 dollars. The study would be based on the latest cost data for the actual plant and transmission system as developed by Bechtel Corporation and C. T. Main, the design engineers employed by the applicants.

As a result of our study Applicants' Exhibit No. 22 titled "Economic Analysis of Total Costs for Generating Power at Alternative Sites" was prepared by Gibbs & Hill for use at the present hearing. The exhibit was prepared under my supervision, direction and control and is true and correct.

In view of the fact that the exhibit itself contains much explanatory material, tables, graphs and like material no detailed testimony concerning it will be presented by me in this statement. However, there are certain pertinent matters which I believe should be pointed out and in some cases, repeated.

The exhibit was performed under the most conservative basis with coal shipping escalations for fuel kept below actual escalations experienced over the previous five years. In addition, wherever possible, small advantages were credited to the remote site alternative so that if the mine-mouth alternative (Colstrip) proved to be the most economical there would be no doubt of its overall superiority as the most economical site.

Both types of analysis previously mentioned (present worth and annual cost) have been included in Exhibit 22 and both indicate that it would be more economical to generate power at Colstrip and transmit power to the west by high voltage transmission line rather than using alternate power generation locations at Hot Springs or Spokane.

Turning next to Exhibit 22 we find it divided into various sections. A table of contents appears immediately preceding page 1. A general discussion follows, generally covering the two analyses used in preparation of the exhibit, the present worth analysis and the annual cost analysis, as well as additional advantages if the generating station is built at Colstrip but which are not reflected in the total dollar differentials. The first of such advantages pertains to the kind of transmission line to be built if Units 3 and 4 are constructed at Colstrip. The larger transmission line contemplated will be a definite improvement over the existing system and will supply a very reliable east-west tie. Furthermore, as more generation is introduced in Washington, with nuclear additions, a greater potential of obtaining lower cost nuclear base load power over the new transmission lines appears likely. The second improvement is the savings of a large quantity of diesel oil required for operating unit trains from Colstrip to Hot Springs or Spokane.

The next section appearing in Exhibit 22 is a discussion of the present worth analysis which appears at pages 2 through 5. To economically evaluate the advantages of siting two 700 mw units at alternative locations it is important to cover all major expenditures over the operational life of the power station, transmission system and necessary substations. In addition it is necessary to bring all expenditures to a common measurement time, such as today, since a dollar spent today is worth considerably more than a dollar spent 20 years later because of the interest earning capability of money. A present worth analysis has therefore been prepared to show the current value of all future costs for a power generation and distribution system with the power generating station located at three alternative sites - Colstrip, the present site for Units 1 and 2, Hot Springs, a hypothetical virgin site in western Montana, adjacent to the Bonneville Power Administration transmission system interconnection, and Spokane, another hypothetical virgin site in eastern Washington, also adjacent to another Bonneville Power Administration transmission system interconnection.

Generation and transmission costs experienced over the operating life of each component of the system can be simplified to fixed and variable costs. Fixed costs are generally related to return on capital investment, taxes, and insurance. Upon occasion operation, maintenance, administration and general expenditures are included in the fixed costs for computational purposes. Variable costs are related to fuel costs, transmission line losses, transmission wheeling charges, and usually operation and maintenance expenditures. These costs are related to the amount of annual electrical generation.

By comparing the present worth of all fixed and variable costs over the equipment life we can establish the most economical location to build the 1,400 megawatt power station.

Details concerning the present worth analysis are found in the discussion and tables referred to therein.

Following the present worth analysis appearing in Exhibit 22 is a section devoted to a discussion of the annual cost analysis at pages 6 and 7. The annual costs compared include all major fixed and variable costs for each alternative plan on a year by year basis. This method of analysis can be difficult to analyze when the annual cost differentials are changing erratically year by year. For this analysis, however, no trend of this type developed and the annual cost differential between the Colstrip, Hot Springs and Spokane alternatives continually increased.

The basic components of the fixed and variable costs for plant, transmission line and substation are detailed in Tables A and B appearing at pages 2 and 3 of the exhibit.

A description of the method of computation of each component of fixed and variable charges is detailed in the discussion and tables referred to therein at pages 6 and 7.

Following the discussions of the present worth and annual cost analyses in the exhibit, an appendix appears at pages A-1 through A-5. The appendix includes a discussion, background material and notes for the various tables which follow.

Following the appendix appears 18 tables at pages A-6 through A-46. These tables are referred to in the previous discussions, as pointed out above. Generally speaking, tables 1 through 15 were utilized in preparing the present worth analysis and tables 13 through 17 were utilized in preparing the annual cost analysis.

Following the tables come figures 1 through 4. The first three figures represent cost diagrams for each alternative plan and indicate the detailed breakdown of all major costs for the individual alternatives as to the annual cost analysis. Figure 4 is a graph in which the figures appearing in table 18 relative to the annual cost analysis have been plotted so that direct comparison of each alternative scheme can be made for each year during the plant life.

The capital cost to build Units 3 and 4 at Colstrip, and alternatively at either Hot Springs or Spokane, were developed using the latest Montana Power cost estimates as the base after review and verification by our staff. In a similar manner the cost to build the necessary transmission lines and switchyards for the three sites were also obtained from Montana Power. Differential operating costs for the power station at the alternative sites were developed. Transmission costs were calculated and a linear loss scheme was used even though this would increase the line losses for the Colstrip scheme. Wheeling charges were computed in accordance with rate information received from the Bonneville Power Authority. Coal costs at the mine and for delivery to the remote sites were calculated using the basic rate used by the Department of Natural Resources Analysis, as included in its Environmental Impact Statement, but the costs were escalated at 4% per annum for the 37 years of the project. This escalation rate is considerably lower than experienced over the previous five years, but the object of the study was to favor the remote site schemes wherever possible and still show that the Colstrip scheme had an overwhelming economic advantage compared to the other hypothetical sites.

Various investigative steps were taken in order to verify the railroad shipping costs used by the Department of Natural Resources in their study and such investigation indicated that the department's shipping costs were reasonable. However, as pointed out above, in our study the rail freight rate was escalated 4% per annum for the 37 years of the project, something that the Department of Natural Resources failed to include in its analysis.

For the purpose of the analysis the fixed costs used for the power station, the transmission lines and the switchyard for the different alternatives included interest on bonds, depreciation, return on equity, state and federal taxes, ad valorem tax and insurance. Operation and maintenance costs as well as administrative and general expenses were treated as a fixed cost for the transmission lines and switchyard only.

The variable costs for the power station alternatives included operation and maintenance labor, administrative and general expenses, fuel cost at the mine, fuel shipping cost, and coal stockpile interest. The variable costs considered for the transmission lines included transmission line losses, wheeling transmission charges, and wheeling transmission losses. No variable costs were considered for the switchyard since operation, maintenance, administrative and general costs were treated as a fixed cost.

Turning to the conclusions of our analysis, each method used (present worth and annual cost) resulted unequivocally in the conclusion that it would be more economical to generate power at Colstrip and transmit this power to the west by transmission line rather than using alternate power generation locations at Hot Springs or Spokane.

Turning again to the present worth analysis (pages 2-5, Exhibit 22) we find that table 1 appearing at page A-6 presents a summary of the present worth of all fixed and variable costs for the installation of the power station and transmission system for the three alternative sites, Colstrip, Hot Springs and

Spokane. Included in table 1 are the various cost factors involved and the costs of each as to the three alternative locations. The present worth cost in 1975 dollars for the three locations as presented in table 1 are as follows:

Colstrip -	$1,006,060,000
Hot Springs -	$1,334,660,000
Spokane -	$1,516,250,000

The differential between the three alternative locations indicated in table 1 shows that the Colstrip site offers present worth advantages of $328,600,000 and $510,190,000 over Hot Springs and Spokane, respectively. The present worth total cost percentage differential shown in table 1 favors Colstrip by 33% over Hot Springs and 51% over Spokane.

Turning next to the annual cost analysis again (pages 6-7, Exhibit 22), we find that table 18 appearing at page A-46 presents a summary of all annual fixed and variable costs which make up the total annual charge. The total annual charge figures appear as item seven under each of the three alternatives listed in table 18. In addition the average annual cost per kilowatt hour has been developed (item eight) as well as the average annual energy charge (item nine). The average annual energy charge has been figured by dividing the total annual charge by the total kilowatt hours generated for that year. The annual charge and energy charge has been plotted in figure 4 (the last page in Exhibit 22) so that direct comparison of the alternative schemes can be made for each year during the plant life.

The total revenue required by the applicants to be received from their customers to operate the plant and transmission systems over the plant life for the three alternatives is set forth in table 18 in the next to last column on the right side of the exhibit (the word "revenue" is used interchangeably herein with the words "charge" and "cost"). The total revenue or cost figures required to operate the plant and transmission systems over the plant life as set forth in table 18 is as follows:

Colstrip -	$7,730,546,000
Hot Springs -	$9,259,041,000
Spokane -	$10,196,370,000

The figures listed in table 18 are the costs in millions unless otherwise noted.

The differential between the three alternative locations indicated in table 18 shows that the Colstrip site offers total revenue advantages of $1,528,495,000 over Hot Springs and $2,465,824,000 over Spokane.

Subsequent to the preparation of Exhibit 22, it has been learned that the schedule for the completion of Units 3 and 4 has been delayed to 1980 and 1981. Our analysis was prepared with the understanding that the units would be completed in 1979 and 1980. If we were to prepare Exhibit 22 based upon the new schedule there is no question but that the costs included therein would be increased because of the delay. However, it is also our opinion that without question the ratio of costs as between the three alternative site locations would remain a constant for all practical purposes and that the Colstrip scheme still has an overwhelming economic advantage compared to the two other hypothetical sites.

Applicants' Exhibit No. 23 is a graph taken from a Montana

State Department of Natural Resources and Conservation study upon which has been superimposed the results of escalating the coal shipment costs 4% annually. The exhibit was prepared under my supervision and control and is true and correct. All of the exhibit except the broken line in the upper left hand corner and the escalation language appearing with it as well as the material source explanation appearing in the lower left corner is identical to Figure 6-1 appearing at page 126 of Volume 2 of the Montana State Department of Natural Resources and Conservation Draft Environmental Impact Statement on Colstrip. The original figure as prepared by the Department of Natural Resources compared the costs of coal shipment versus six estimates of transmission costs (A through F) over the 37 year life of the facilities. Figure 6-1 purports to show that the cost of shipping coal is cheaper than building transmission lines but the department omitted from its analysis any escalation of coal shipment costs over the years, an omission corrected by me. The coal shipment costs to Hot Springs have been escalated by me the conservative figure of 4% per annum from 1975 and this is reflected by the dotted line in the upper left hand corner of Exhibit 23. The dotted line shows that if the coal shipment costs are escalated in this manner the costs of coal shipment for all years with the exception of the first few years will exceed the transmission costs and in fact, will run off the exhibit at the top between the 9th and 13th year because the annual costs in millions of dollars exceed the maximum annual cost of $54,000,000 which was the top figure used for Figure 6-1.

EXAMINATION OF ROBERT S. PETTIBONE

Cross, by Department of Natural Resources and Conservation

By Mr. Sheridan:

Q Mr. Pettibone, I've looked at your statement. I take it from your conclusion on preparing rail costs to transmission line costs that one of the partners of this consortium on the Colstrip project, PGE in particular, is all wet?

A I'm not aware of what you are alluding to.

Q You are aware that PGE is building a coal-fired generating facility near Boardman, Oregon?

A At Boardman? I've heard of that.

Q And that they're getting the coal from east of Colstrip?

A I'm sure there are many places that they could get coal. I'm not fully aware of the circumstances around Boardman; it's just a name that appears in the power periodicals.

Q When were you first contacted by the applicant, or Montana Power in this case, to serve as a consultant?

A I believe it was February 18, 1975.

Q By whom were you contacted?

A Mr. Roger Hofacker, together with Mr. Bellingham.

Q Prior to this contact, had you or your company done work for Montana Power Company?

A No, sir.

Q How much do you charge an hour?

A Well, it varies on who the people are that are working on the assignment. How much --

Q What is your personal rate per hour on this particular consulting job for the applicant?

A I can't precisely tell you; it's somewhere in the order of $80.00 per hour.

Q Would $86.00 an hour ring a bell?

A That's a good, round number.

Q That's it, isn't it, sir?

A I beg your pardon, sir?

Q That's your rate, isn't it?

A That's approximately the rate, within a couple of dollars of the rate.

Q That's what you testified your hourly rate was on deposition taken April 10, 1975, last year, when Mr. Shenker took your deposition, isn't it?

A That's approximately what it is.

Q Have you on occasion served as consultant to any other of the partners or members of the consortium proposing the development of Colstrip 3 and 4?

A The answer is no.

Q Have you done any work on coal-fired generating facilities in the Pacific Northwest?

A The answer is no.

Q Have you done any analysis of the alternative costs between rail haul and transmission of electricity in the Pacific Northwest, other than the work you performed for the applicant after being employed as a consultant in February, 1975?

A No, sir.

Q Has your company ever been involved in the construction and operation of rail haul facilities for the hauling of coal from a mine to a generating station?

A Well, that can't be a yes or no answer, so may I explain?

Q Certainly.

A Our firm has been involved in railway transportation problems for something over 60 years; that's what put them in business back in 1911 when the partnership was formed. They were engaged by the Pennsylvania Railroad to engineer and design the electrification of that railroad between New York and Philadelphia. Since that time we've had a substantial number of people engaged in transportation problems, railway transportation problems around the world. We're continuing to design modifications to electrification systems in the United States, together with a brand new electrified railroad that is now being constructed down in Texas, specifically for hauling coal from a mine to a power plant. It's a short one, approximately, I guess about 15 miles.

Q Has your firm ever constructed and been responsible for continued construction problems relating to the operation of a rail segment of a coal handling system?

A I have to answer no. We are not railway constructors; we are engineers and designers.

Q Did you consider the possible electrification of rail lines from Colstrip to any of the hypothetical sites you considered in your study on behalf of the power company?

A The answer is no.

Q Did you know there used to be an electrified railroad going west towards Spokane?

A I recall, when I was a youngster, a good segment of the Great Northern Railroad was electrified. It was abandoned, and I can't tell you when.

Q You are familiar, are you not, with the Black Mesa Railway?

A I have read of that railroad, and that was constructed to haul coal to the Four Corners area, I believe.

Q How long is that line, if you can recall?

A I have to answer that I don't truthfully know; I have an impression that it's approximately 50 or 60 miles long.

Q And are you familiar with the size of the rail cars used?

A They are something in excess of 100 ton.

Q What assumptions did you make with respect to the carrying capacity of rail cars in your study considering the alternative to transmission lines?

A In this case we made no assumptions about the size of the rail cars; we elected to accept some of the criteria that found its way into the impact statement prepared by the Department of Natural Resources, and I believe in that case they were talking about 55 car trains.

Q You don't recall the size of those cars, do you?

A No, I don't. I would expect that it was somewhere in the order of 100 ton capacity which is pretty standard for dedicated unit train operation carrying coal in the United States.

Q At the time you commenced your study on rail haul, did you make direct contact yourself with any representatives of Burlington Northern?

A At the time we were doing the study, no.

Q Did the Montana Power Company or any of its representatives, or any representatives of the other members of the consortium on the Colstrip project, provide you with any studies comparing the advantages or disadvantages of rail haul to transmission lines, conducted prior to the time you became a consultant?

A The answer is no, if you are talking about a formal study. We have seen pieces of paper that different members of Montana Power's staff made available to us; the authorship, I can assume, was in Montana Power or some of the consortium members.

Q I assume, then, that whatever was given you by Montana Power Company, or other consortium member representatives, was not independently checked for accuracy? I'm referring now to what was given you by them?

A Whatever they gave us, we made an independent check -- whatever was used of the information that was made available to us, we made an independent check as to the validity of the material.

Q What did you use that was provided you by the power company?

A Principally the work that they did in their planning activities as to the amount of power they would be moving on the transmission system from Colstrip to the western part of the state and west of the state.

Q What did they tell you that they were going to move? You can refer to your exhibit, if you have it.

A We have diagrammed in the back of our report -- we have diagrammed for ourselves the elements making up the transmission from Colstrip to Hot Springs, and on to Spokane and west of that, in an attempt to delineate for ourselves the factor of cost entering into, the cost of the transmission system. The amount of power that was to be moved was in the order of 1400 megawatts; 1390, I believe is the number we used in our study. That's from units 3 and 4.

Q You assumed that 1390 megawatts would be moved west from Colstrip units 3 and 4 over the transmission line?

A Yes, sir.

Q Do you know the size of Colstrip unit 3?

A I understand that the nameplate, or nominal rating, is 700 megawatts.

Q The same for 4, right?

A Yes, sir.

Q So all but 10 megawatts you are going to move west, in your study?

A Say it again, please?

Q All but 10 megawatts of that capacity, you intend to move west from 3 and 4?

A Leaving Colstrip, moving west.

Q Did you consider at all, in your transmission of energy west from Colstrip units 3 and 4, the power to be moved west generated from facilities 1 and 2?

A That was to be moved, as I understand it, on another transmission line, part of the whole system, but on a 230 KV rather than a 500 KV being proposed.

Q So, I want to be sure that I'm clear on this. You, in your base calculation for energy transmission on the side of transmission lines as opposed to rail haul, assumed that the generation of power at Colstrip units 3 and 4 would allow you to transmit 1390 megawatts out of 1400 megawatts, westward?

A That is correct.

Q And that units 1 and 2 were not to be moved over those lines?

A 1 and 2 were to be moved on the existing 230 KV line.

Q Now, did you include both the 230 KV line and the 500 KV line as one side of the comparison against rail haul?

A We were comparing a double circuit 500 KV line carrying 1390 megawatts of energy versus moving the equivalent energy as coal by rail.

Q Now, was this 1390 megawatt assumption a constant, or was this just capacity?

A We followed the methodology suggested by the Board of Natural Resources in their impact study, that as the plant grew older it would operate at a lower capacity factor.

Q Why would that be?

A Why would what be?

Q The lower capacity with age?

A Well, historically in the past, as the utilities were enjoying great growth in the order of 8 to 10 percent per year, they were constantly bringing on ever larger, newer equipment operating at better efficiency, and these newer units were always dedicated to a base load operation and older units took up a more intermediate position in the dispatching of these different units. So the obvious -- it was obvious to the Board of Natural Resource people, in their assessment, that as these units 3 and 4 grew older they would follow the historic path of older units being relegated to an intermediate or even a peaking type of operation. I do not necessarily subscribe to that principle; I believe that units being dedicated today will, if they're properly maintained during their lifetime, enjoy a high capacity factor for much longer periods of time than is shown in this study by the Board of

Natural Resources and the criteria, as we call it, that they've established.

Q Has there ever been a coal-fired generating facility in operation for more than 25 years in the United States which has shown an increased efficiency; I'm not talking about the addition of additional capacity by modification, but increased efficiency as the result of lengthy operation over a number of years?

A Are you asking whether the unit became more efficient as time moved on?

Q Yes, assuming now that we just don't consider the first year when they're just starting out, but say they hit the peak after two years of operation. Is there any unit, that you know of in the United States, that over a 25-year period has actually increased its efficiency and has not sustained a drop-off in efficiency similar to the assumption used by the Department of Natural Resources?

A Mr. Sheridan, I want to avoid semantics, so may I ask a question before I answer?

Q Surely.

A As it sounds like your question is not necessarily talking about efficiency, but rather availability or reliability. Efficiency in my mind is the conversion of fuel into electric energy, and we talk of that as the heat rate of the unit, that is, so many BTU's per kilowatt hour. To answer your question absolutely, I am not aware of a unit that increases in its efficiency as it gets older. I am aware that units, after a seasoning period following their commissioning, have improved in reliability; the operation of the equipment is tuned, it has an opportunity of being debugged and as years go on its availability rises over, say, its first few months of operation; and then as time moves on, if the owner pays less attention to its maintenance, its availability may fall off to the end of life. Now, I hope I answered your question, but you were using the word efficiency and I had to qualify it.

Q I think the record's clear now on that. It's true, isn't it, that in order to maintain reliability as opposed to efficiency over a longer period of time in the operation of a coal-fired generating facility, that it takes more maintenance?

A More than what, sir?

Q Well, just about anything we own today, a car, a truck, anything as it gets older requires more maintenance to keep it running, doesn't it?

A I certainly subscribe to that idea as far as an automobile is concerned. If they could only build them as good as refrigerators and guarantee them for five years, we'd all be happier; but large, modern steam generating equipment today, I think, can be maintained at a reasonable level without great expense on an annual basis. I think there are a number of operators in the United States that take excellent care of their units, and some of them are performing better today than when they were new, and they may be 20 to 25 years old. It's a never ending chore for them; they have to dedicate a maintenance crew to the maintenance of it, but as compared with this total scrapping of it, as we do our automobiles, they can well afford the maintenance effort that goes into it.

Q Did you consider, in the alternative between transmission and rail haul, the increased maintenance of the transmission lines as time passes?

A We have a factor in there for maintenance. I think the industry will say that the maintenance of a transmission line, except for acts of God, is a very nominal expense.

Q What's the nominal expense you used, starting from year 3 as compared to, say, the 37th year in the study?

A I think we had about 1 percent of the value of the system per year.

Q And was that a constant from year 3 through year 37?

A Yes.

Q Of course they are figuring the life of the transmission line at 65 years, aren't they?

A Yes, that's the assumption that was made.

Q Tax life on the plant is 22 years?

A On what?

Q On the plant itself is 22 years, isn't it?

A The tax life on a plant, I think we show that in our account, I think we had 22½ years.

Q Yes, 22½.

A Yes.

Q What's the tax life for your study on the transmission line?

A 24 years.

Q Did you contemplate, in your study, the replacement of any of the transmission lines themselves during the 37 year period of the plant?

A No more than could be handled by that 1 percent maintenance factor.

Q What's going to be the cost of the transmission lines themselves, not counting the towers and other associated facilities?

A I can't give you a specific answer. If you're talking wire --

Q Yes, sir?

A I truly don't know, Mr. Sheridan.

Q Who supplied you with the data of a generating station, as shown in your figure 1, insofar as costs are concerned with respect to interest on bonds, depreciation, return on equity, state and federal taxes, ad valorem taxes and insurance?

A We received all of that information from the Montana Power.

Q Did your staff, or did you make any effort to verify those figures by checking independently of the sources from Montana Power?

A Only to the extent of comparing them with what we understand other utilities in the United States attach to these factors.

Q And did you familiarize yourself with the taxing rates within Rosebud County or the counties over which the transmission lines went?

A Specifically, the answer is no.

Q You didn't have the opportunity then, I think it's fair to say, to compare taxing rates on a public utility, for utilities other than Montana Power Company in the State of Montana?

A We compared the principal factors in this material that Montana Power gave us, such as the fixed charges, interest on borrowed money, return on equity, depreciation, the insurances, etc. These factors we compared with a broad list of utilities in the United States and we find general agreement with utility practice.

Q What's the return on investment that you calculated for the generating station shown on figure 1?

A If you'll take a look at table 13, which is page 830, I think that highlights the elements that we're talking about and the basis that we -- what we have used in these computations.

Q In other words, 15 percent?

A Yes, sir, 15 percent.

Q Now looking at the figure 2, you show the Colstrip-Broadview transmission and switchyard 230 KV double circuit for Colstrip units 1 and 2. Are those figures included in the base for your comparison with the rail haul?

A No, sir.

Q After you had been initially contacted by Mr. Hofacker and Mr. Bellingham in February of 1975 regarding the consulting to the applicant, how did you determine the two hypothetical sites for location of generation stations as used in your study?

A These were determined by the impact statement prepared by the Board of Natural Resources, or suggested by them.

Q You did not then, I take it, consider other sites which may or may not have been more economical than those suggested or mentioned by the Department of Natural Resources' Environmental Impact Statement?

A That would have been outside the bounds of our study.

Q The bounds of your study did not include, I take it, the location and construction of a generating facility in places other than Colstrip with a generating capacity less than 700 megawatts per unit?

A No, we were dealing with the two proposed 700 megawatt units for Colstrip 3 and 4.

Q In dealing with the proposed Colstrip units 3 and 4, did you consider at all the question of load requirements within the service area, or the requirement for wheeling of power eastward or westward from the Colstrip site?

A No. Our bounds of our study were to determine the relative cost of taking this energy from Colstrip 3 and 4 westward, and comparing it with the cost of rail transportation for the equivalent coal. In other words, as we've attempted to demonstrate in our report, we considered these hypothetical alternatives at Colstrip, or Hot Springs or Spokane, and lifting Colstrips 3 and 4 and locating them at these hypothetical sites, modifying the costs of the hypothetical sites or the equivalent of the common facility that they will enjoy at Colstrip. We have attempted to identify those considerations in our report on table 1, on about page A-6, and table 2 starting on A-7, and I guess runs through to A-8.

Q Now, you were contacted initially on February 18, 1975, right?

A February 18.

Q 1975?

A Yes, sir.

Q Where were you when that contact was made?

A In my office in Omaha.

Q When did you first come to Montana?

A I think I was here the day following or the day after that; I'd have to refer to my diary.

Q That's good enough. It was within a week anyway?

A It was the same week and within a day or two.

Q At that time of your first visit to Montana Power Company and Montana, did you accumulate documents or written reports from the power company concerning their studies?

A The documentation that I picked up at that instant of time was -- I believe I got a copy of the Westinghouse Environmental Systems report, their environmental report, and a draft of the summary impact statement prepared by the Board of Natural Resources.

Q Did anyone else from your company accompany you for the purposes of accumulating data?

A Not on that trip; I was by myself.

Q After you were given the opportunity to review the Westinghouse Environmental analysis, did you contact anyone from Westinghouse?

A No, sir.

Q Did you have any conversations with members of the Department of Natural Resources concerning their draft Environmental Impact Statement after you had had an opportunity to review that statement?

A No, sir.

Q When did you then return to the State of Montana to accumulate more data for purposes of your study, either by yourself or in accompaniment of individuals from your firm?

A Well, the first trip that I was by myself was, we'll call it surveillance, information gathering visit. It was after we began to read the information I brought back in those two reports, that the picture became clearer as to what the Montana Power was asking us to do, and we were able then to mobilize our forces and our people, picking out the skills that we thought we would need, and we returned then to Montana; I believe it was the following week, in mid-week; perhaps seven to ten days had elapsed, but --

Q The latter part of February?

A Yes.

Q When was your draft of your report published, April?

A We had a draft that we submitted to Mr. Bellingham in late March or early April.

Q Were there any changes in --

A More specifically, I think it was the same day that I gave a deposition to Mr. Shenker in Billings, now whatever day that was -- you probably have a --

Q April 10, 1975.

A Okay.

Q Was there any change in your preliminary draft delivered to the power company April 10 of '75 incorporated into the final report marked Applicants' Exhibit number 22, dated May, 1975?

A In substance, no. We had more time to specifically look at some absolute numbers, but they had ever so minor effect on what appears in the final edition, the green-bound copy that you have in front of you.

Q From whom did you obtain information concerning the cost of construction of Colstrip units 3 and 4 and the associated facilities?

A The specific individual?

Q Yes.

A Principally the costs of the Colstrip project were made available to us by Mr. Labrie of Montana Power.

Q Did your organization undertake any effort to determine, independently of Mr. Labrie's information, the estimated costs for Colstrip units 3 and 4?

A Yes, sir.

Q What did you do?

A Beg your pardon?

Q What did you do?

A We are engineers and constructors of a number of coal-fired plants that would be contemporary of the Colstrip 3 and 4; we have a keen awareness of the costs of our own efforts, plants under our own cognizance; our estimating people make that available to us on a regular basis, and we compared the elements of our own job to the elements making up the Colstrip plant.

Q What 700 megawatt facility are you working on now other than the work you've done for Montana Power?

A I'm somewhat at a disadvantage; I can't hear you very well.

Q What 700 megawatt facility is your firm working on now, of a coal-fired nature, other than the work you are doing for Montana Power?

A We have just completed a station at Clarksburg, West Virginia for Allegheny Company, which consists of three 650 megawatt coal fired, and it would be super-critical pressure rather than the sub-critical pressure of Colstrip -- that was a station totally designed by Gibbs and Hill and constructed by Gibbs and Hill.

Q How much did that cost?

A That work was started in 1968, the first unit went into service in 1972, and the succeeding units were about a year apart; I think the total cost of the plant ran to 408 or 410 million dollars.

Q And that's for all three of the 650 megawatt units?

A Yes, sir, three identical units.

Q Now I take it following your initial conferences with Montana Power, you decided you would undertake an analysis for present worth and for the annual costs of the two systems and comparing them, rail haul versus transmission lines?

A Yes, sir.

Q What does present worth do in terms of economic analysis?

A Well, for projects that are of long duration and not completed until some time in the future after they're commissioned -- to recognize the powers of our economic life in this country, particularly escalation and so forth, to present worth something is a convenient mechanism of bringing those dollars that are to be spent in the future back into the present day; more particularly, when these costs and expenditures are made at different periods into the future, to bring these costs back into a commonality of today's costs.

Q If I were to desire to reduce present worth, say, to today, for the expenditure of $100.00 ten years from now, or the expenditure of $100.00 twenty years from now, in reducing it to present worth, which of those two periods would add more to the present worth of dollars? Figure for today.

A $100.00 ten years from now and $200.00 twenty years from now?

Q No, $100.00 ten years from now and $100.00 twenty years from now?

A In the present day numbers?

Q Right.

A Well, $100.00 ten years from now is worth -- well, what interest rate do you want?

Q Let's take prevailing rates, about 9 percent?

A Why don't you pick either 8 or 10?

Q Is that what your table says?

A Yes.

Q Okay, 8.

A Well, $100.00 ten years from now is worth about $4.63 today; $100.00 twenty years from now is worth about $2.14 today; now that's in single payment, rather than in any uniform series.

Q So, assuming you have large expenditures further down the line in time in the operation of a coal-fired plant, the further down the line those expenditures occur in time will reflect a lower value in present worth; will they not?

A That is correct.

Q Conversely, if there are higher initial costs, and low maintenance costs, the expenditure of monies for something like a transmission line would not sustain a large initial present worth?

A That is correct because you're spending a relatively small amount of money as times goes on.

Q That can tend, can it not, to make the present worth appear much lower when comparing, say, a generating plant when you have higher expenditures over a period of time than you would with a transmission line with low expenditures over a period of time?

A No, I think that's converse of that, Mr. Sheridan. If you spend a lot of money today or in the next couple of years, let's say two or three years in the future, the present worth of that money today is a higher number than a similar expenditure way out in time.

Q What's going to cost more to run over a 37-year time period of that plant, the plant itself or the transmission lines?

A The plant.

Q What contacts did you have with representatives of C.T. Main concerning the transmission lines?

A We have had no contact with C.T. Main.

Q What contact have you had with representatives of Bechtel Corporation?

A Same answer, Mr. Sheridan.

Q Then any information which Bechtel or C.T. Main generated, you did not discuss with them in your study if you obtained that information from Montana Power?

A That is correct.

Q I'm interested in your statement on page 6, commencing at line 20; do you have your statement in front of you?

A The report in my --

Q The written statement?

A Okay, line what, sir?

Q Line 20 on page 6.

A Yes.

Q You say, "Whenever possible, small advantages were credited to the remote site alternative so that if the mine-mouth alternative, Colstrip, proved to be the most economical, there would be no doubt of its overall superiority as the most economical site." Let's talk about those small advantages you gave the alternative sites. What are they?

A Well, I think there are two significant ones; if you will turn to table 2, page A-7 of the report, I can point them out to you.

Q Okay.

A Under the column, "Existing Site, Colstrip, Montana," we show in there the cost of a pipeline to the surge pond 3 sub (b) of $11,790,000 of the cost of that pipeline. At the hypothetical site of Hot Springs or Spokane, you'll see that we only assigned $1,000,000 at the hypothetical site.

Q All right, now, let's take Hot Springs, Montana and that $1,000,000 that you assigned to the pipeline. What design work did you do at that hypothetical site to determine it would only cost $1,000,000?

A We estimated a very nominal kind of a site situation where the plant was probably close to a large body of water from which it could get water, and the actual distance that -- I can't tell you what we estimated; it was just to give recognition to the fact that it was considered, I guess, Mr. Sheridan.

Q Have you ever been to Hot Springs, Montana?

A No, sir.

Q Have you ever been to Spokane, Washington, at the new site?

A No, sir.

Q Do you know, or have any idea, what the competing uses are for water available, assuming it's available, near Hot Springs?

A No, sir.

Q Is the same true for Spokane?

A We treated these hypothetical sites as truly just that; whether it's feasible is another consideration.

A Now, the $11,790,000 figure you show for the existing Colstrip site under 3(b) there, "Pipeline to Surge Pond," do you know if that pipeline there also delivers water to Colstrip units 1 and 2?

A Yes.

Q Does it?

A The intent of that existing pipeline is to take care of all units.

Q So, it's there anyway, isn't it?

A This is a pro rata share of it.

Q The total cost of the pipeline, to your understanding, is $43,000,000?

A I couldn't tell you what the total line is, Mr. Sheridan.

Q Okay, let's take a look at some more small advantages?

A I can tell you some other advantages that I think exist. Under item 3(a) on the same page we show a new pump house to serve two 700 megawatt units at a hypothetical site under the Hot Springs or Spokane situation, of $2,900,000. By the same token, we only show $2,000,000 at Colstrip. I would expect that the real cost of a pumphouse in a real situation would probably be considerably more than $2,900,000. We gave a rather skimpy estimate in that connection with the hypothetical sites, not knowing what the sites are or the conditions. The $2,000,000 under Colstrip, you have to recognize, is an increment cost of an existing pumphouse now serving units 1 and 2, as compared with $2,900,000 which is our estimate for a pumphouse that is a new pumphouse and not an increment to something existing. Similarly, under Hot Springs and Spokane situation, under 3(e), the coal handling facilities which have to be designed to handle a unit train delivery of coal, we assessed that at $17,500,000. I can assure you that that is a low number because we have currently a job in Omaha, Nebraska, where we are designing exactly the same facility for a large coal-fired station, and the cost on that facility, again a handling unit train delivery, is substantially more than $17,500,000. I think at today's costs it's well over $19,000,000, if not $20,000,000. These are samples of what was intended by that statement we made that these are small advantages that we believe make the hypothetical site appear attractive.

Q Okay. Let's go to 2(a), the "Site Location Studies." Is it your understanding that only $500,000 was spent on location studies for Colstrip 3 and 4?

A That's what we were told.

Q How come it's going to cost half again as much for Hot Springs, Montana or Spokane, Washington?

A Well, when you start to look for a site for a new plant, we're talking of a virgin site, most utilities, unless they already have a piece of property nailed down and dedicated to it, even though it is undeveloped, want to explore the relative economics of the development of a number of sites. We have just completed a study for Indianapolis Power and Light in Indiana where they have asked us to help them in selecting a site for a large generating facility. I think we looked at 14 specific pieces of property and in the examination we consider what the costs of the plant may be when built at each specific site, what the relative availability of cooling water is, and the cost implications in getting that water, the cost implications of receiving and handling the fuel and the ashes from the plant, and they vary, as you can appreciate, from site to site. Finally you narrow your studies down to a situation of rank, one site having a better rank or preference to another site. So, I think the assignment of $750,000 to a site study is possibly low if you have to undertake a number of sites because, in the course of the site study, you want to know more than just what I've already enumerated; you want to try to get some real specific data, such as the very preliminary soil borings to determine what the cost implications are of founding the plant at that particular --

Q Okay. Did Montana Power Company tell you about its alternative site studies in the State of Montana?

A No, sir.

Q You don't know how many sites they say they have analyzed, other than Colstrip, do you?

A I'm not aware of it.

Q But the figure that Montana Power gave you for all their site studies, wherever they may be, and for Colstrip 3 and 4, only came to $500,000?

A Came to what, sir?

Q $500,000, that's the figure you've given me.

A That's what I understand we got from the Montana Power.

Q Who gave you that figure?

A I suspect that number came out of Mr. Blankmeyer's office.

Q Now, you've doubled mapping expense, too, for the Colstrip site --

A Yes.

Q -- as compared to the Hot Springs site. What mapping are we talking about here?

A The geodetic surveys that you want to determine for the site, that is. It's truly a surveying activity. You're trying to find out what your cuts and fill have to be on the site.

Q And you say that for two 700 megawatt plants at alternate locations it's going to cost $100,000 each, yet it's only going to cost $50,000 at Colstrip, considering the fact that there are four units there, 2100 megawatts, a town and a coal mine?

A $50,000 is a number that they expect to spend on their surveying operation for units 3 and 4.

Q You are not going to have to concern yourself with mapping activities for the alternative sites, prospects of locating a town, or concerning yourself with downwind air pollution hazards?

A In the mapping activity?

Q Right.

A No, this is a very site specific activity.

Q How come it's going to cost twice as much to do a foundation investigation in Hot Springs, Montana as it would in Colstrip?

A First of all, we would expect that a substantial amount of foundation information is already known from the drilling logs that they obtained when they did site test boring on units 1 and 2; therefore, there would have to be relatively little expended in foundation investigations for an expansion on the same site.

Q Actually, in so many words you are saying, "Because we've got two units there, it makes more sense to us to put two more there than it does to look elsewhere"?

A When you're considering these type factors, that's right.

Q Now, looking at the question of environmental studies, I see that it's raised half again as much for the new sites as it would be for Colstrip; why is it required that you spend less money for Colstrip than you would at an alternative site for environmental considerations?

A Probably it can be explained this way, that at an existing site, a great deal of data that would be required for the environmental report is already known to the report preparers. If you enter into a new site, it is our experience, and a very current experience, that you have to dig in and develop new site specific data not known, not in the record. You have to employ archeologists to determine whether there are buried artifacts; you have to employ, if you are on a body of water, aquatic biologists, terrestrial biologists to determine what exists at a virgin site, and that has to be taken into account; you have to weigh the impact of the plant on the site specific elements.

Q Well, you've got to do that at Colstrip, too?

A Yes, but to a lesser degree. The information data gathering requirements at Colstrip for an expansion would be less than the data gathering activity at a new site.

Q Then, how come the site application cost at Spokane is going to be $2,600,000, where your site application cost recorded here for Colstrip is only $1,300,000?

A Well, I guess that it was our judgment that, perhaps tempered by what we were finding in our way of life in things nuclear, as time moves ahead, it costs a heck of a lot more to obtain permits and defend the application than it has in the past, so we bumped that one.

Q Well, you're aware, aren't you, sir, that the $1,300,000 was the filing fee in this application?

A I think that's the number that was given to us, yes.

Q Okay. Well, isn't that a filing fee also that you're showing twice as much for Hot Springs and for Spokane?

A That's what it appears, yes.

Q Okay. Why do you calculate that filing fee for Spokane, who did you talk to in Spokane, or in the State of Washington?

A That was a judgment number, Mr. Sheridan.

Q Well, judgments are based on fact or information, I would assume, and I want to know who you talked to and where you got the schedule that says $2,600,000 filing fee in the State of Washington at Spokane at this alternative site?

A I cannot answer that question; I do not know.

Q Well, how did you get the figure then, just dream it up?

A It's our judgment.

Q Based on what?

A Well, the trend of permit costs. May I perhaps sum up something here for you? If you go to the next page you'll see, under line 9 -- correction, line 5 -- the sum of the capital costs differentials which sum up all of these elements that we have listed that we have been talking about, and you'll see that there is a penalty to the hypothetical sites of about $20,000,000, as compared with Colstrip.

Q Well, I agree with you that that's what the figures show, but I'm still interested in this figure that you come up with; just like when I buy a new car, I want to know what the accessories cost, and that's what I'm asking you; how did you come up with $2,600,000?

A I thought I had explained that to you. I was trying to develop something for you, Mr. Sheridan, that if you wanted to neglect totally the $20,000,000 that we have assessed against the hypothetical sites, just rub them out as though they do not exist, and compare it with the costs that we're showing back on table 1, I think you'd quickly recognize that it has little impact, little substance, in the differentials that exist between the hypothetical sites and Colstrip. Our attempt in table 2 to delineate in these factors, and whether they are absolute, can be supported by engineering estimates, and preliminary engineering seems to me unimportant. It was an attempt to delineate for our client that we did take a look at these factors and put numbers against them, and we could be challenged on any number that you care to bring up. But I am saying that if you neglect the whole of the table 2 findings, that is on the sum of these capital costs differences, it has virtually no effect in the outcome of the study that we've undertaken for this client.

HEARINGS EXAMINER: It is time for a break. Let's take a ten minute recess.

(RECESS AT 10:05 A.M.)

Following a brief recess, the hearing reconvened at 10:30 A.M. on January 27, 1976.

HEARINGS EXAMINER: We will proceed with Mr. Sheridan's cross-examination.

MR. SHERIDAN: Thank you.

CONTINUATION OF EXAMINATION OF ROBERT S. PETTIBONE

Cross, by Department of Natural Resources and Conservation

By Mr. Sheridan (continuing):

Q Mr. Pettibone, we're still back on table 2, where we left off before the break. I notice that in your cost calculations on table 2 for the existing site at Colstrip, in many instances you have the word written "existing"; what did you, when you say "existing" in any of those columns, say for an administration building, a railroad site, a construction facility, machine shop, laboratory equipment, and so forth; did you allocate costs to 3 and 4 with those facilities?

A No, the note at the bottom of table 2 explaining the single asterick I thought was self-explanatory that if the facility had to be built for 1 and 2 and did not have to be repeated for 3 and 4 at Colstrip, we did not put a cost -- allocate expenditures of money for those elements at the Colstrip site.

Q Okay. So, even though they're going to be used, to some extent, for 3 and 4, you don't count that as cost; right?

A That is correct.

MR. BELLINGHAM: Excuse me. I don't think Mr. Pettibone had finished his answer of that; I'm not sure.

A We attempted to show what would be expended in the development of 3 and 4 at Colstrip; and, as I said earlier today, what would have to be spent if we lifted the generating units of 3 and 4 to another site. At an existing site, as at Colstrip, any newer units that may appear on the site, has a significant cost advantage of sharing existing facilities.

Q Did you use the cost for those existing facilities as a base for the calculation of depreciation as an operating expense for the operation of 3 and 4 in your comparison with the transmission line study?

A No, it should be obvious that we did not do that because we are working in our comparison, if you will note; we were working with a total capital cost of expenditures required for 3 and 4 at Colstrip or at a hypothetical site. If those numbers do not appear under Colstrip, then, obviously, they did not appear as the total capital cost.

Q Then, for depreciation purposes, which on an annualized cost basis in your analysis, you wouldn't show the use of those facilities or the depreciation of those facilities as a cost in comparing it with transmission lines; would you?

A That is correct.

Q But that's not what really happened, is it, accounting-wise?

A I don't know how deeply they break it out. We're really dealing, Mr. Sheridan, with differentials between these two plants in the numbers here.

Q I appreciate we're dealing with differentials; but what I'm saying, and correct me if I'm wrong, the annualized cost figure, for purposes of comparison between the operation of 3 and 4 and the transmission line, do not show the use of those facilities as a cost for the operation of 3 and 4, as an annual expense; do they?

A No, not as an absolute. But we believe we have taken care of it as treating it as a differential.

Q Looking at table 3, Mr. Pettibone, you have 11 as a value of larger reserve coal pile; what's the reserve coal pile at Colstrip now for units 3 and 4?

A We assume that -- I guess we were told -- that Colstrip would maintain a 60-day supply of coal on the ground at the site. We assume, and would, after discussion with the client, that at a remote site where they have greater exposure to interruption of delivery of coal, that they would want to carry a 90-day supply of coal. Now, so this is a reflection of the differential costs of the 30 days of coal laying on the ground and the interest that is represented by that 30-day supply.

Q Are you aware of what the coal reserve is for the Boardman coal-fired generating facility being constructed by PG&E?

A No, sir.

Q And on number 10 there on table 3 you show the additional labor force will cost an addition $9 million at Hot Springs and $10 million for Spokane?

A Yes.

Q That means more jobs, doesn't it?

A Yes, the work force at the hypothetical sites would be increased -- I think we had -- if it were at Colstrip, I think the manning chartwe had for Colstrip 3 and 4 would share 19 job positions with units 1 and 2; at a remote site, these jobs would have to be duplicated. So your answer is correct;

it would mean more jobs.

Q Looking at page 7 of your statement, commencing at line 11, you make -- do you have that in front of you?

A I'm with you.

Q It says, "The larger transmission line contemplated will be a definite improvement over the existing system and will supply a very reliable east-west tie. Furthermore, as more generation is introduced in Washington with nuclear additions, a greater potential for obtaining nuclear base-load power over the new transmission lines appears likely." Who's going to need that base-load power for nuclear facilities in Montana?

A Our supposition is that whether there is an absolute need, only time will tell. If there's a cost advantage to the utility and ultimately to the consumer, it may be advantageous to import low-cost nuclear power, if it's available; if there's a surplus of it for some period of time in the western states.

Q Wasn't it your basic assumption, that we talked about in the first portion of your testimony, that 1390 out of 1400 megawatts would be moved westward?

A That's what we were comparing with hauling coal.

Q Do you think it's logical that the members of the consortium to Colstrip units 3 and 4, none of whom have their primary service area east of Colstrip, and all of whom have their primary service areas west of Colstrip, would be engaged in this venture if they thought they were going to be shipping their power in Washington or Oregon to Montana?

A I think that power development today, which is undertaken on a regional basis, as evidenced by the proposed Colstrip project, is an attempt on the part of the partner utilities to share with one another their additions to their own systems. It cuts down the need for individual systems to carry a relatively high reserve. Whether or not this low-cost nuclear power would ever become available to Montana is highly speculative. There is just a comment there that a strong east-west backbone tie, if you will, makes such a sharing of generation possible.

Q Incidentally, when you undertook your study to compare rail haul costs with transmission line costs, did you consider shipment eastward?

A Shipping coal from Colstrip east?

Q Right.

A No, sir. I'm aware that coal is going east from Colstrip, or from mining facilities in the region; but that was not a consideration in the matters we had under study.

Q In determining the freight rates, did you consider what the rates charged for those hauls were?

A No, sir. We have examined a contract for hauling coal from Wyoming down into the Omaha area. Essentially the same rail distances are involved, and essentially the same costs are also involved in the freight rates. In our study, one of the things that I should tell you about is that one of our transportation experts did spend some time examining, in Washington in the ICC library and, additionally, in the library of the American Association of Railroads, a host of published freight rates for similar types of haulage and for similar distances; and his advise was that the number of 9½ mills per ton mile used by the Board of Natural Resources Impact Report confirmed the number they were using for that time period. He said that after examining a host of published information for that type of haulage on a unit train activity, that it was quite in line with what other railroads were charging for similar hauls.

Q Dropping down on page 8, starting with line 10, you give some discussion of fixed and variable costs. Why would you consider, upon occasion, the inclusion of fixed costs for operation, maintenance and administration?

A What line are we talking about?

Q Starting on line 12.

A The assumption here is that in the case of a transmission line, which has, as we said earlier, a very high present worth value because the ongoing cost of the transmission line was very minor, considering relative to the first costs, that, for computational purposes, it seems easy, prudent and reasonable, to lump the ongoing administrative maintenance costs as a fixed cost, and not a highly variable cost, as in the case of operating a steam plant.

Q Have you discussed with any of the other consultants to the power company, the effects of the change in price on demand, the effects of lowered income on demand, or the effects of climate upon demand for electrical energy?

A We have held no discussions with other consultants working for the power company.

Q Would use of rail haul facilities to load centers near Spokane or Hot Springs provide the opportunity for more employment in both the states of Washington and Montana, based upon your analysis, than you would have with the use of 3 and 4 at Colstrip?

A I'd have to say that there probably would be more people employed in hauling coal than would be operating units 3 and 4 at Colstrip. Now, whether, in fact, that is an absolute, I don't know that I am in a position to comment; whether the railroad manning forces would allow them to take on this additional load without a substantial increase in the number of people they would employ, we have not investigated that; we have not talked with the railroad people. That comparison was made by the Board of Natural Resources' Impact Statement; and I think there is probably some validity to the conclusion they reach, that they would employ some more people.

Q Are you aware, sir, that the vice-president of the Burlington Northern in Billings, Montana has stated that they can haul all the coal there at Colstrip?

A I'm not aware of the statement; I have no reason to doubt it, either.

Q Were you aware that as of April, 1975, American railroads have 25,383 additional railroad coal-hauling cars on order?

A I know there are a substantial number of cars on order because we have been involved in buying some this past year; and I'm aware of the competitive forces in the marketplace in getting coal cars.

Q What's the distance from Colstrip to Hot Springs?

A I think that the number we used was 550 some miles.

Q And what's the distance from Colstrip to Spokane?

A We used a number of 700 miles.

Q Were you aware that Burlington Northern now is hauling coal from Wyoming to Texas, nearly 4,000 miles difference?

A Yes.

Q And they plan to make movements by 1978 over distances of 1400 - 1600 miles?

A That could very well be. It should similarly be pointed out, I believe, to keep the record straight, Mr. Sheridan, that the purchasers of coal in Texas, Arkansas, Illinois and places like that, are dependent upon the Burlington Northern, Milwaukee and the Union Pacific Railroad for delivery of coal to the south and the eastern part of the United States. Really, they have no choice; in order to obtain what we call a compliance fuel to meet the emissions standards set by the Environmental Protection Agency.

Q Well, there are nuclear facilities in those states, aren't there?

A Yes.

Q And in Texas there's even a solar facility for one entire town being built, isn't there?

A I wouldn't be a bit surprised that somebody is looking to solar energy for some activity; but whether it's viable for power remains yet to be seen.

Q Have you ever done any work on solar power?

A No, sir.

Q You could not say that PGE, one of the members of this consortium, has only the alternative of coal at their Boardman facility, could you, as you asserted insofar as these other states are concerned?

A If it's a fossil burning facility, I would definitely say that's the only alternative that they have. I don't think the Federal Energy -- FEA, Federal Energy Authority -- would permit a unit to be installed that was -- lacked the ability of burning coal.

Q Oh, how about nuclear?

A That's the other alternative.

Q Well, PGE just put on, in December of 1975 -- PGE just put on a nuclear plant onstream; did you know that?

A Yes.

Q In fact, every member of the consortium, other than Montana Power, now have interests in the generation of electrical power through the use of nuclear generators; did you know that?

A I would expect that that is so.

Q What line loss factor did you consider in your analysis of transmission line usage?

A Well, if you would direct your attention to page A-12, Table 6, and it runs over to the next page A-13, I think you will see how this was treated in our analysis.

Q Where did you get the information to state that the average line loss in the years 1-9, assuming 80 percent load factor, would be 51.2 megawatts?

A The basic information came from Montana Power?

Q Did you do any independent calculations?

A Yes, sir.

Q What calculations did you come up with?

A We came up with the good agreement with our calculations.

Q Were they lower or higher?

A I think they were right on.

Q What's the factor, then, that you used to describe the value?

A I guess I don't follow you on that question.

Q How did you compute it?

A The formula that we were using?

Q Right.

A I don't have that readily available. The results, I guess, is all that I could talk about.

Q Going to page 13 of your statement, you do disclose that subsequent to your preparation of Exhibit 22, which is your report dated May, 1975, that additional costs were projected that had not been included in your study. You also conclude that it is also your opinion that, without question, the ratio of costs between the three alternative site locations would remain a constant; could you tell me why it's without question, the ratio is going to stay the same?

A Where are you reading, Mr. Sheridan?

Q Page 13, commencing line 22; well, actually line 19.

A I don't have a page 22 -- what line, sir?

Q Page 13 of the statement I was provided, starting at line 19, and actually what I read to you started at line 22, concerning your opinion on the ratio of costs.

A Well, we did our work on the basis that the units 3 and 4 would be onstream in 1979 and 1980, respectively; and, oh, a short time ago, about the time that I was preparing this written testimony, we learned that units 3 and 4 had been delayed a year to 1980 and 1981. This delay of one year is certainly going to have some effect on the cost of the plant at Colstrip, or anywhere; simply because it's a year later and escalation is a constant force in our way of life and will have an effect on the final cost. But the ratios of the cost between Colstrip and the alternative locations, we would expect to be nearly constant.

Q Well, looking at Table 2 and commencing on -- I mean, Table 2 on page A-8 of your Exhibit 22 -- you assume, then, that because of the delay, which you had been advised by the power company has occurred, you would expect an equal increase in the cost of land between the existing site at Colstrip and new sites in Hot Springs or Spokane; and the same cost for site exploration would be present?

A I would expect there would be some forces that weren't, that would raise these factors, these elements that we show for the alternative sites; certainly some of the costs that we indicate for Colstrip would possibly be pretty level for a one-year delay; but in the costs of equipment that would go to one of these sites, be it Colstrip or the alternative site, will have the effects of escalation on them because delivery will be held back.

Q Well, I think the point is more accurately that you're going to have some variance in the cost projections on each of these sub-items with the passage of time, aren't you?

A That's perfectly reasonable, that there will be that effect. That was what we attempted to say, but also, I think that the ratio of the differences will be nearly constant.

Q You haven't done any calculations on that, have you?

A No, we haven't attempted to quantize that.

Q Okay.

MR. SHERIDAN: I don't have any further questions.

HEARINGS EXAMINER: Mr. Graybill?

Cross, by Northern Plains Resource Council

By Mr. Graybill:

Q Mr. Pettibone, examining your Exhibit 22, on page 4 appears the statement, "All schemes require installation of transmission lines from Colstrip to Broadview for removal of power from Colstrip units 1 and 2." What transmission are you including in that analysis?

A We're talking in that instance, we're talking about the 230 KV line from Colstrip into Broadview.

Q Well, there's a 230 KV existing line, built in '70, '71, '72 or '73; are you talking about that one?

A That, I believe, was to be doubled up.

Q Well, as a matter of fact, there's a double 230 KV convertible line being built now; is that what you're talking about?

A That's what we're talking about, yes.

Q And does this mean that you included the costs of this in the Colstrip plant or the plant that is envisaged at Hot Springs or the plant that is envisaged at Spokane; what are you doing with that information? You say "all schemes"?

A Yes. If I may refer you to Table 5, page A-11, we attempt to identify on this table, the data that was developed from our data gathering trip to Montana Power, on the costs of the transmission lines leaving Colstrip to Hot Springs, to Broadview, the conversion to a 500 KV, the cost of switchyards; also, the cost of transmission lines from Hot Springs, from Colstrip to Broadview, and Billings to Anaconda and Hot Springs; all a part of the whole system that would be served by Colstrip's 1 and 2 and 3 and 4.

Q Well, are you saying that the costs on Table 11 or Table 5 on page A-11, for example, the Colstrip to Broadview 230 KV double circuit, 1976; are you saying that that cost is always a cost for the Colstrip alternative in your comparisons?

A No.

Q Then what do you mean when you say "all schemes"?

A In that case, yes, that's a 230 KV line. Yes, that appears in all of our comparisons.

Q In other words, you always embedded that $17 million into the Colstrip alternative; isn't that what you're telling me, whenever you compared it to the Hot Springs and Spokane plant sites?

A Well, it's there, sir.

Q Is that what it means when it says, "All schemes require the installation of transmission lines"?

A That's what it means.

Q Now, that particular transmission line, sir, is called a convertible 230 KV?

A Yes.

Q Do you believe that that figure in 1980 for conversion to 500 KV's is all the difference is between the 230 and the 500 KV lines?

Q That's what the client has told us, and they get that information, I suppose, from their consultants for the design of the transmission lines.

Q Well, in a hearing before the Board of Natural Resources on November 7, 1974, held in Billings, Montana, their then engineer, Mr. Greve, who was at that time the head of the Portland office of C. T. Main, was asked to compare the cost estimate of the double circuit 230 KV with the convertible KV; and his summary sentence is, "In comparison, the total cost" -- let's see, he says, "With these figures, the total cost of the steel tower line would be approximately $16,700,000; in comparison, the total cost of the two wood pole lines would be $13,800,000." There is a difference here of approximately $2,900,000; so, the power company, at least, was well aware that the 230 KV lines would not cost the same as the convertible 230 KV lines; now, did you take that into consideration when you made Exhibit 22, if you know?

A If I may direct your attention to --

Q I beg your pardon; I can't hear your answer.

A May I have a moment with a colleague of mine?

Q Do you want a recess, Mr. Pettibone?

A Yes.

Q Well, it's all up to the Hearings Officer. Apparently, the record will show you don't know the answer to that question and you'd like to check it out; is that right?

A Just for clarification.

MR. GRAYBILL: May we have a 2 or 3 minute recess, Mr. Hearings Officer?

HEARINGS OFFICER: If it's agreeable with you; otherwise he could answer, if he doesn't know at this time; and you could continue with his cross.

WITNESS: I couldn't give you a direct answer without it.

MR. GRAYBILL: It's fine with me if he takes 2 or 3 minutes and checks his answer.

HEARINGS OFFICER: Alright. Very well.

(RECESS: 11:15 to 11:18)

HEARINGS OFFICER: Very well. We're back on the record. Do you want the question repeated, or can you answer the question now?

Q Alright, Mr. Pettibone, what do you think?

A The answer is "no," sir.

Q No what? No, the convertible feature is -- what do you mean; explain your answer.

A We did not take into consideration that point you're making about that hearing in Billings. I'm not aware of the proceeding or anything.

Q In other words, the figure that you have included in Table 5 for the Colstrip to Broadview 230, is really the figure for the Colstrip to Broadview convertible 230; that's what you mean, because, you see, the $17,558,000 is actually a few hundred thousand higher than Mr. Greve estimated, which was 16,700,000. I wouldn't argue with you about that difference; but, in other words, it is obvious, isn't it, that you've concluded the convertible line there and you really wouldn't need a convertible line if you weren't going to move -- you really wouldn't need the convertible line if you were comparing the other system;

isn't that right?

A Well, that's correct; but we didn't use that convertible line in our -- in the other schemes.

Q Well then, your sentence here that "All schemes require the installation of that transmission line" is not correct and factual; is that what you're saying? On page 4, my initial question was: Why do you say that all schemes require that transmission line; and did you use that transmission line as a necessary cost under "all schemes"? Now, to make it clearer to you, Mr. Pettibone, I would certainly agree with you that if you built a plant at Hot Springs or Spokane, you would still have to move the power from 1 and 2, which I presume you're not talking about, into Billings or somewhere, and you would need 230 KV lines; but you wouldn't need 230 convertible KV lines, would you? So you should not have included that cost in as a basic cost under all systems or all schemes; and I imagine, if you really mean what you say, which is that you did.

Q Well, I would like to say that what our words here, "All schemes require the installation of transmission lines from Colstrip to Broadview for the removal of power from units 1 and 2." and that is so. In the instance of an alternative site, such as Hot Springs or Spokane, we have not included the convertible costs in those alternative schemes; but the basic 230 KV lines are there.

Q Now I think, if you will pardon me, I think I can show you that you really have included them. Let's look at the line under transmission system costs, Hot Springs or Spokane; and the first item is 1976, and it says, "Colstrip to Broadview, 230 KV double-circuit, 115 miles, 17,558,000," which is identically the figure that you've used up above in the event you were having Colstrip generation.

A Yes, but that -- the conversion cost is not included there.

Q Well, what you don't seem to understand is that the conversion costs is not all the cost of the double -- of the 500 KV line, with the convertible feature. The conversion cost is to change the wires after you've built the bigger towers; we've already learned that from some other witnesses. And in this 17,558,000 figure is included 2 or 3 or 4 million dollars to make that system convertible; but clearly, in the Hot Springs-Spokane case, it doesn't need to be convertible, does it? So, in fact, you've got an inflated figure for the cost of the Broadview, Colstrip plant line; isn't that right?

A These numbers that appear here are values and costs that we have obtained from Montana Power. We've carefully reviewed these and how we've used them with Montana Power. Now, if you're saying that 17,558,000 reflects a convertible cost, I can't vouch for that.

Q I see, well, I guess that all that shows is that maybe Montana Power didn't tell you all about the system. On page A-3, when you describe Table 5, you say that, "This table indicates the present estimated cost for transmission and switchyard systems" and your study is dated May, 1975; what is the time period for which you have secured the figures shown on Table 5?

A Well, the time period is indicated on Table 5; 1980 are the in-service dates for those several elements there making up those costs.

Q Well, Mr. Pettibone, are you aware that in the period from 1973 to 1975, the estimated cost of that transmission line changed many times?

A I would expect that it could have.

Q Now, I'm trying to find out what times you finally chose; in other words, I'm trying to verify that 221 million is the latest cost that this transmission line is estimated?

A That information would have been given to us approximately in March of last year.

Q So that's what the applicants told you that it was going to cost in March of last year; is that right?

A That's correct.

Q Are you aware that the Board of Natural Resources estimated the cost of that line higher than that; did you compare those figures?

A I saw an array of numbers in the Impact Statement, I think they had. The Board of Natural Resources indicated 3 separate estimates based on different sources of information that they showed.

Q Did you make any effort to analyze your base figures with the 3 different DNR figures?

A Yes, our transmission people examined the cost estimates that had been prepared by MPC or their consultant, and we found good agreement with these numbers; that's why we used them.

Q How did you account for the changes that had taken place between 1973 and 1975 in the estimated cost of this line?

A I'm unprepared to answer that. I would expect that more detailed engineering took place in that ensuing period. They were able to get a clearer picture on the cost aspect, together with the forces of escalation that are ever with us having an effect on costs. But, more particularly, the number that we've been working with settled out, as a consequence, of more detailed engineering by Montana Power's consultant on transmission.

Q Did you find any, or do you believe there's any differential in the escalation of costs for transmission line construction as against power plant construction?

A I would expect that the same cost factors would be involved in a given time period; material costs would probably advance at probably the same average annual rate. Any single commodity is suffering from the problems of supply and demand, and if a cable manufacturer has very little work, you can often negotiate a pretty attractive number, as compared to when he is pretty well loaded. I think these are forces that work constantly.

A In computing the line losses on the long transmission line from Colstrip west, did you use just industry averages or did you use the Ontario Formula for Corona Loss, or how did you compute the line loss?

A I personally did not compute these; our transmission's people generated these numbers, and the methodology they employed, I can't answer.

Q Do you know whether it took into effect the differences in altitude on this particular line?

A I'm sure they examined that part of it, because we were -- I'm sure to the extent that we were talking one day -- I was involved in some discussion when we were talking about corona losses.

Q Do you know by what method they computed the corona loss on this line?

A No, sir; I do not. I cannot give you a specific answer.

Q What is the overall line loss that you computed on this line?

A If you turn to A-12, you'll see the -- Table 6 -- you'll see the values that we've used in our study; which I believe are in reasonably good agreement with what the Board of Natural Resources used in their work. I think any differences are miniscule.

Q Why is there a correlation between the year and the load factor drops?

A It's a loading regimen of the plant that was projected by -- it's evident in the Impact Statement prepared by the Board of Natural Resources. They show a declining capacity factor in different periods, first 9 years and then in ensuing 7-year periods.

Q Well, are you just taking the figures here that the Department of Natural Resources computed, or is there some reason why you believe that between the 17th and the --

A Well, I said earlier -- you weren't here, sir -- I said earlier, we were attempting to use criteria that the department used in their Impact Statement to make a comparison between the costs of coal haulage and the cost of generation at hypothetical sites. We used in many instances the same numbers rather than generate new values that our own personal judgment might have selected, because we couldn't quibble too much with the values that were used. I don't agree that in today-life in the utility and power industry that necessarily these plants will be unloaded as time moves on. There's no true advantage to do so for perhaps two reasons, two significant reasons: Ever larger units are not on the threshhold of being developed that would improve heat rate significantly over units of this size; the other, and later units in any planning units are always going to cost more than today's units.

Q That's assuming constant inflation, of course?

A That's a pretty good assumption, I think; it has a great deal of validity.

Q Okay, I'm not arguing with it, but I just think when you make a general statement of that nature, surely we can't disagree that everything will always go up forever; that's assuming some economic conditions that happen to be indemnic in the last generation in America; isn't that what you're saying?

A I think that we don't have to -- we can go much further than the one generation; we can go many generations and show a value in purchasing power of the dollar has been rather constant in its increase.

Q Alright, well, now, all I'm saying is that it is assuming constant inflation?

A You're right.

Q Okay. Now, let me ask you another question. I understand that there are reasons why -- I tend to agree with you -- if you've got the plant built, you're going to continue to use it; I can't imagine that in the 25th year, you're somehow going to use it at 55 percent of capacity, if all the things I heard last week about demand are true. Did you cut down in the amount of coal that you computed that you would have to haul for the 55 percent ratio?

A Yes, sir. This is shown on -- I think it's illustrated reasonably well on Table 10, page A-26 and 27, where you observe that the tons of coal per year are coming down as the capacity factor is coming down. Column number 4 of that table.

Q And did you apply some factor for the fact that if the tons of coal dropped, the cost of coal delivery might be greater or less?

A As the quantity of coal being delivered comes down, it's not sufficient to offset what we believe are the escalation costs for freight rates.

Q Again, based on constant inflation?

A That is correct. We assume in our computations here, a very minimal escalation factor, though it is constant for the lifetime of this study.

MR. GRAYBILL: I think that's all I have, Mr. Hearings Examiner.

HEARINGS EXAMINER: Mr. Bellingham, re-direct?

MR. BELLINGHAM: I have some witness scheduling problems, sir. Would it be possible, perhaps, to recess at this time?

HEARINGS EXAMINER: Before you have your redirect?

MR. BELLINGHAM: Yes, sir.

HEARINGS EXAMINER: What time could you return?

MR. BELLINGHAM: Well, say 1:10 or 1:00, or whatever you have in mind.

HEARINGS EXAMINER: Do you think you could finish this witness and your next one this afternoon?

MR. BELLINGHAM: Yes, sir. I think it's possible.

HEARINGS EXAMINER: Do you have any objections to that gentlemen? (no response) Alright, we'll recess until -- let's make it 1:00. Can you do that, Marie, alright?

(RECESS: 11:40.)

The hearing was reconvened at 1:08 P.M., following the lunch recess.

HEARING EXAMINER: You may proceed with the redirect, Mr. Bellingham.

CONTINUATION OF EXAMINATION OF ROBERT S. PETTIBONE

Redirect, by Applicants

By Mr. Bellingham:

Q Mr. Pettibone, I'd like to call your attention to page 6, line 17, where you state that the exhibit was performed under the most conservative basis for coal shipping escalations for fuel kept below actual coal escalations experienced over the previous five years. Now, then, I would like to call your attention to Exhibit 22, page A-29. What do you have contained on that particular page?

A This is Table 12, which tabulates the escalation percentages of freight rates for quite a number of years back. I am actually going back to 1960, and we have it on this table, showing it up through 1973.

Q I'd like to stop you at that point. Where did you get the material upon which this particular table, and I'm referring to Table 12, is based?

A This is published information by the American Association of Railroads, and that's where it's docketed.

Q Do you believe these figures here are true and correct when applied to the Burlington Northern coal escalation?

MR. SHERIDAN: I'll object. He's calling for a conclusion of the witness beyond the scope of expertise of this particular witness. He's also outside the scope of cross-examination. I have no questions on this table.

HEARING EXAMINER: Which table is it you're on now?

MR. SHERIDAN: Table 12.

MR. BELLINGHAM: It's part of the exhibit, sir, regardless.

MR. SHERIDAN: That doesn't open the door to anything.

HEARING EXAMINER: The objection is overruled. You may answer.

MR. BELLINGHAM: Do you remember the question now, Mr. Pettibone?

WITNESS: I thought I answered the question where we got the information.

MR. BELLINGHAM: Then I asked you a further question, which was objected to. Would you read the question back to him, please?

REPORTER: Do you believe these figures here are true and correct when applied to the Burlington Northern coal escalation?

A I have to believe they're correct because we see evidence of their use in another contract for hauling coal, the same railroad for a project that our company is involved in.

Q Your figures go through the year 1973, am I correct?

A Yes, sir.

Q Do you have any further figures to supplement those figures through 1973?

A Yes, sir, we have recently obtained from a representative of the Burlington Northern indices for 1974, a projected indices, a range of indices for the year 1975.

Q Will you state what those figures are?

A In 1974, the index is 187.4; the percent escalation relating to that is 11.6. They have a range and they give it to us as a range because it is an indices that they are still massaging, I guess, in their company; for the year 1975, it ranges from a low of 211.76 to a high of 215.51, which gives an escalation percentage for that year of 10.4 to 12.

Q In other words, the 10.4 figure to 12% would be the range of escalation for the year 1975 over the year 1974?

A That is correct.

Q Calling your attention to the second paragraph following the table -- perhaps I can shorten this up by reading it to you. "The average escalation for the last five years listed has been 7.28%. The lowest escalation has been 4.2% during this period." That's correct, is it not?

A Yes, sir.

Q In the light of the further figures that you have obtained and which you previously testified to, what would be the average escalation over the past five years terminating with the year of 1975?

A Our computations show us that the average escalation for the previous five years is 9.23% and the lowest point of escalation over that five-year period is for the year 1965, which is 6.6, which in 1972 is your 6.6%.

Q Now, then, you indicated that the average escalation over the past five years would 9.23%. That includes the year 1975, does it not?

A Yes, sir.

Q And you indicated previously that there was a range in 1975 10.4% to 12%?

A That is correct.

Q What figure did you use for the year of 1975 in arriving at that particular figure, 9.23%?

A We used the lowest indice, the lowest of the range of indices. We used the lowest of the percent escalations.

Q What was that?

A The range being 211.76% escalation, 10.4.

Q Do you have a figure if you use the highest?

A No, sir.

Q You have indicated in the next paragraph, the one immediately following the one referred to, and to which you testified immediately preceding this, that a conservative escalation for shipping fuel, 4% per annum, has been used in the analysis. This greatly favors use of remote sites, since it reduces the cost of shipping coal. Why do you say that it is a conservative escalation?

A Well, go back to the table that I indicated before, and we can go back quite a number of years, all the way back to 1960, and there were only four years out of that decade and a half where the escalation rate was less than 4%. There were approximately nine of those 15 years where the escalation rate was in excess of 4%, significantly in escess of 4%.

Q You were asked upon cross-examination whether or not your firm had conducted, or whether or not you had conducted similar studies other than the study made the subject of Exhibit No. 22, in the Pacific Northwest, and I think your answer to that was no. Is there anything unusual about this particular study?

A We don't view it so. It is simply a case of bringing down and reducing to paper elements of making up an estimate, elements of projecting costs throughout the lifetime of a plant or a facility, and we don't think this was particularly unique to many, many other studies and reports that we've had to write on comparing alternatives.

Q Would you please detail, if you would, a few of these alternative studies that you referred to?

A Gibson-Hill, where the engineers conducted a feasibility study for the Vermont Yankee Nuclear Power Plant in behalf of the Vermont Public Service of Vermont, the private utility there, comparing its cost advantages with the cost advantages of a coal-fired plant for their system. We did a similar study for the Omaha Public Power District in 1967, and it resulted in a nuclear power plant, their first one in their system. We have had a number of them for various foreign clients in Italy and Spain, Taiwan. We have done a considerable number of studies for various clients. I mentioned one this morning, for Indianapolis Power and Light, on a site study. We've done the same thing for Allegheny Power Company, another one for the Omaha Public Power District in Omaha. Those are just a few of the major ones that I can recall that

I was personally involved in.

Q Upon cross-examination, you were asked various questions relative to Table 2, appearing at page A-7 of your Exhibit No. 22. Do you recall those?

A Yes, sir.

Q You were asked, for example, why you assigned certain figures to certain items, is that right?

A That is correct.

Q At item 6 on page A-8, what do you have inserted?

A Well, line 6 of that page is the actual capital cost differentials between the alternative sites and Colstrip.

Q And that means, then, that based upon the previous figures appearing in Table 2, the cost of a new site at Hot Springs and a new site at Spokane is $20,430,000 more than Colstrip, is that correct?

A That's our estimate, yes, sir.

Q Now, then, if you reduced these alternate site costs the twenty million figure that you referred to applying to Hot Springs and Spokane, to the figure zero, what impact would that have as to the conclusion of your study?

A Negligible.

Q Why do you say that?

A Because we're comparing a $20,000,000 figure when reduced to a levelized annual cost of some three odd million dollars to a cost of shipping of coal of many millions of dollars.

Q I think you were asked the question this morning about how much energy was moving west from Colstrip, and I think the figure of approximately 1390 megawatts was used by you. Do you recall that?

A Yes, sir.

Q What site did you intend that particular figure of 1390 megawatts to apply to?

A Hot Springs.

Q Let us start at the site of Colstrip and move this energy further west. What is your understanding as to how much energy will be moving west, assuming that all four plants are in operation?

A Well, the fully developed site at Colstrip has a capability of 2100 megawatts. We are assuming that approximately 300 odd megawatts is leaving Colstrip via the 230 kv existing circuitry and that approximately 1800 megawatts would be leaving Colstrip via the 500 kv double circuit that's been proposed. I guess that answers the question.

Q Let's trace the movement of the energy along the line. Is there any part of those figures that you indicated routed out of the system, for example, the Billings Broadview area?

A Well, the elements that were making up our comparisons show that approximately 400 odd megawatts of the 1800 megawatts are peeled off in the Billings-Helena area, with the residual 1390 megawatts, the ultimate, finding its way into the Hot Springs area.

Q That leaves 300 not accounted for, and where is that dropped off?

A I said earlier that 300 of the 2100 was leaving Colstrip via 230 kv.

Q Yes. Where is its destination?

A In the Broadview area.

Q So that brings us down to the 1390 megawatt figure, approximately, at Hot Springs, is that correct?

A Yes, sir.

Q Does that include Puget's share?

A That includes Puget's share of their ownership of 1 and 2.

Q Now, on cross-examination you were asked a question that I'm not sure I understood. I'm not sure you did. It dealt with whether or not a 230 kv line and substations were included in the transmission costs, and I am not sure of what your answer to that was, but in any event, to clear it up, do you know whether the 230 kv line and substations are included in the transmission costs?

A Yes. I think that's explained better on Table 5 of page A-11.

Q It is included?

A Yes, sir.

Q Now, you previously were asked certain questions regarding the fact that you have in your written testimony small advantages for credit to the remote site alternative, and as far as the transportation cost of coal is concerned in this particular study, you used the figure of 9.5 mils per ton mile, did you not?

A Yes, sir.

Q Would you say that is a conservative figure?

A I think that's possibly on the low side.

Q And I think you previously testified as to why you picked this figure, didn't you?

A Yes. Our people made a search of some records at the ICC and the American Railroad Library in Washington and reported back to us it was a reasonable, rational type of number for the time frame that it was called out in the impact statement prepared by the Board of Natural Resources.

Q You mean the Department of Natural Resources?

A The Department of Natural Resources.

Q Did you use linear line losses instead of any other calculation?

A We used linear line losses, knowing that they would favor the alternative sites rather than the ratio of the squares.

Q Why did you use that?

A Well, our posture in this study has been to be as conservative in the numbers that we were using in the study in weighting against, say, a Hot Springs or Spokane situation, and that is one minor element, if you will, of that expression of conservatism that we were trying to put in here.

Q This method was also used, I think, in the --

A In the Department of Natural Resources. They elected to use a linear relationship rather than a ratio of squares.

Q You were asked, once again, with relation to Table 1, appearing at page A-6 of Exhibit 22, questions regarding the amount that you have tabulated in item 2, line f, appearing at page A-7, the site application costs of $1,300,000 at Colstrip, and $2,600,000 at the other two alternative sites. Do you recall that?

A Yes, sir.

Q Have you refreshed your memory since the question was put to you as to the reason for the discrepancy in the figures, and answer yes or no.

A Well, yes. I think I can add a small comment here. We know, from the Montana Power Company, that the application costs in the order of $1,300,000 for Colstrip. If another site was determined for this project, again, a fee would have been assessed against the new site and the likelihood -- the new site, then, would have to carry the burden of the costs of all the study and preliminary work that the client had already done on Colstrip, namely, the site application costs, and if it wasn't used as property, then it should be borne by the costs at the other sites; therefore, essentially, it's double.

Q I think you were asked a question -- I don't recall the exact wording -- relative to this study involving the moving of any coal east from Colstrip, or did you do an analysis regarding this. Do you know of any reason why Colstrip coal should be moved east insofar as generation in the Pacific Northwest is concerned and in the Montana Power Company service area?

A All it could do would be to raise the costs of power above what we have talked about here in our report, that is, a new site taking Colstrip east -- coal east -- would have to carry the burden of the transportation charges for that coal and then there would also be an incremental cost on transmission from that easterly site at least equal to Colstrip.

MR. BELLINGHAM: I have no further questions.

HEARING EXAMINER: Mr. Sheridan.

Re-cross, by Department of Natural Resources and Conservation

By Mr. Sheridan:

Q Your responses to Mr. Bellingham's questions interests me, Mr. Pettibone. I thought it was the policy of this country to develop coal resources, isn't that right?

A The policy of the country to develop --

Q Isn't that the Administration's guidelines right now, that coal resources be developed?

A I think the Administration's fuel policy is unclear at the moment.

Q You don't think that it's been articulated by the Administration of the United States government that the coal resources should be developed in this country?

A Many people in our industry, and I mean people like Gibson-Hill and the engineers that are serving the utilities, together with the utilities, have been giving great encouragement to the opening up of mines, but the policy makers seem to negate that as a viable way, or resistance is being offered.

Q Do you know now how many contracts for the delivery of coal eastward Montana Power Company, or through its subsidiary, Western Energy Company, has?

A No, sir, I do not.

Q And you have had no conversations, I assume, with company representatives, either of Western Energy Company, or the Montana Power Company, regarding their intents and their actual practice with respect to coal sales?

A I am aware that Western Energy is selling coal to the East.

I have no idea of the quantity of coal or the number of separate contracts that they have.

Q You concluded, didn't you, sir, that it just wouldn't be economical to ship coal westward, though?

A Those are essentially the findings of our study.

Q Do you know that one of the members of this consortium approached Western Energy Company to purchase Colstrip coal to ship to Boardman, Oregon?

A That doesn't surprise me.

Q Do you know Western Energy Company refused to sell that coal?

A No, sir, I'm not aware of that.

Q You made some speculative comments whether or not a fee would have been assessed had one of the alternative sites been located in Spokane, Washington. Have you ever spoken to a representative of the State of Washington through any planning agency regarding fees for applications for coal-fired generating facilities?

A No, sir, I have not.

Q Have you ever seen any statutory scheme for the assessment of fees in that state?

A No.

Q Have you talked to anyone regarding the calculation of fees in the State of Washington?

A Only with Montana Power.

Q And did they tell you there was going to be a fee assessed?

A They are aware of what we have in our report, sir, and they did not tell us that we were in error in that regard.

Q Who told you from Montana Power Company there would be a fee assessed of approximately 2.6 million dollars for the application for the construction, or a permit to construct a coal-fired generating facility in Spokane, Washington?

A At the risk of sounding evasive, I can't say who that person is. I don't know, but we have the strong impression that that was discussed.

Q Who refreshed your memory on this subject during the break?

A My colleague that's in the room with me.

Q Who's that?

A Mr. Potts.

Q And he's been sitting here all through your testimony?

A Yes, sir.

Q Now, you also related on redirect examination in response to questions by Mr. Bellingham that representatives of your firm had gone through the American Association of Railroads library and the ICC files to determine the freight rates in the Northwest, is that right?

A Yes, sir.

Q Did anyone from your company make any contact with Burlington Northern for a rate, quote, between Colstrip and Hot Springs and Colstrip and Spokane?

A No, sir.

Q Doesn't that strike you as being a little bit more direct in the search for information?

A I don't know that it is any more direct. It certainly is more direct. I don't know that the results of it would have been any different or any better than what we have indicated in our report. I said we examined a number of freight rates for unit train haulage on western railroads for distances comparable to what we are talking about in the report, and the freight rates that our study revealed indicated that the number that the Department of Natural Resources used in their impact statement was a rational and reasonable number for the time.

Q Do you have much experience in railroad rate making?

A Do I, personally?

Q Yes.

A No.

Q Do you know if these are contract hauls or just interstate tariff hauls?

A I know that on unit train situations, most of these are negotiated and are not necessarily determined by a rate-making body.

Q Directing your attention to Table A-8, Mr. Bellingham asked you some questions about line 6 there, differentials, and I think in response to the hypothetical question that if the costs at Hot Springs and Spokane were reduced to zero, it would be negligible insofar as the effect upon the study, is that right?

A That is my conclusion.

Q Why did you study it?

A Sir?

Q If you reduced it to zero, why study it?

A Well, if we hadn't indicated these elements here, somebody may have asked us if we had considered it, and we thought it prudent to lay out on a piece of paper what these differentials might be, to give some credibility to the fact that we did consider these as appropriate to weighting between the several schemes.

MR. SHERIDAN: I have no further re-cross.

HEARING EXAMINER: Mr. Graybill, do you have any re?

MR. GRAYBILL: Yes, I do.

Re-cross, by Northern Plains Resource Council

By Mr. Graybill:

Q Mr. Pettibone, let's start with Table 12 that your counsel examined you on. I understand that on Table 12, you're attempting to show the escalation in freight rates for coal, and then you take an average escalation of 4% and apply it in this study, is that right?

A We used 4%, sir, as a constant escalation rate in our study.

Q And your counsel read you the third paragraph below your chart on Table 12. He says that a conservative escalation for shipping fuel, 4%, has been used in this analysis. This greatly favors the use of remote sites, since it reduces the cost of shipping coal. Now, of course, a 4% escalation doesn't reduce the cost at all. Do you mean it reduces it compared to an 8% cost?

A That is correct. That's the intent of that statement.

Q That isn't what it says, though, is it? Surely you don't mean that an escalation of any kind reduces the cost of moving coal, do you? That's just a little inaccuracy in the text, is that it?

A Yes, I guess I'm a poor author there. The intent was to say we had used 4%, which would be significantly less than if we had used some higher number.

Q Well, the higher number you wanted to use was the last five years, which was 7.28, right?

A That would have been the average, yes.

Q And your counsel wanted to make it a little better, so he gave you two more years of escalation in one of the highest inflationary periods in our history, and he ran it up to nine point something, didn't he?

A That is the average for the last immediate five years.

Q And you wanted to say that what you really meant was that 4% was less than 9%?

A Substantially so.

Q Now, I just happened to take the first five years of your chart, since you, for some reason, I don't know why, but you felt that it was significant to go back to 1960, and I added up the first five years there and I found that the average escalation in the first five years was 1.4%. Would that be an escalation that greatly favors the remote -- use of remote sites and reduces the cost of shipping coal? I guess I took 4%. I took 1960 through 1964 -- four or five years -- I don't know how you figured that. You've got five years shown there. If you add it up, you'll find that's 6.9 divided by 5, and that's 1.4, sir.

A Well, I guess my arithmetic differs a bit, sir. I come up for the first five years that it's about 2.38, not less than 1%.

Q Did you use the 5% escalation figure there in 1960?

A Yes, sir.

Q Well, take that out and start with the year 1960, where you have index No. 70 --

A No, sir, you cannot do that.

Q Well, you can't escalate the first year, because that's the base year. I understand that, but between 1960 and the end of 1964, it escalated 1.4%, didn't it, on an average?

A Then we're talking four years, not five.

Q Well, January 1, 1960 to December 31, 1964, is not four years in my book. Now, maybe it is in your book. That may be one of the reasons you're having trouble with these figures.

Q Sir, I think you have to -- the first period of escalation is the difference between the 1960 indice and the 1961, which is 2.3.

Q Why? Didn't the rate go up at all during 1960?

A It would have gone up if we had also indicated what '59 was, and I'm sure it did, but I can't give you that value.

Q Well, taking your base index number of 77.4 and working it through 1964, where your base index number was 84.4, you'll find that the total escalation is 6.9, and if you divide that by five, you'll find that's 1.4. Now, if you want to challenge that mathematics, I'm perfectly willing you put in another exhibit showing me that the math is wrong. The point really isn't whether it's 1.4 or 2.3, the point is that either of those 5-year escalation periods are way below a 4% average, aren't they?

A I have to concede that.

Q So what you really have done is, you have escalated for 39 years, or 37, whatever the life of this plant is, at a rate that includes a couple of very high inflation years in America, haven't you?

A No, sir.

Q You don't think 1973 was a high inflation year?

A 1973 was a high inflation year, but in our computation, we did not use a number anywhere approaching that factor. We arbitrarily stopped at 4%, and that's all that was used.

Q But you compared it to some very high percentage years, in order to be able to make the gratuitous statement that it was conservative, didn't you?

A Well, you're being subjective when you say it's gratuitous.

Q Well, I'm not being any more subjective than you are when you say it's conservative, am I? Isn't the word "conservative" also subjective in this situation, when your own chart shows that if you take the first five years, it's 1.4 and if you take the last five years, it's 7.28, and if you take the five years your counsel wants, it's 9.3? It looks to me like it's all pretty subjective, isn't it?

A Well, sir, it's only an attempt to show that in our calculations we had used, we thought, a relatively modest -- it's not low -- escalation rate to give credence to the fact that like every other service or commodity that is in our society today, we have to take into account the forces of escalation.

Q Well, the other day I saw a fuel advertisement -- I think it was from the oil companies -- and it said that gasoline had not gone up since 1929 or 1930, when it was fifty or sixty cents a gallon. Are you telling me that you have to assume a 4% raise throughout history, or something like that? The fact is, that unless you can get the coal charges to escalate, you can't prove your case here, can you?

A I think the case has been proved because we have given count to escalation. I think it's rational, something reasonable, something in the real world. To say otherwise, is to ignore the reality of our situation today.

Q Well, what evidence is there in your study to show that a 4% raise is going to continue on for 37 years? You can't show that that's historically so for 37 years. You haven't. You haven't even attempted to do that. You picked a very short term, namely, 13 years, and you've then said that you've averaged somehow what you think is those 13 years. What I'm trying to point out is that you don't have any basis in here for the fact that freight rates are going to continue to go up. You haven't shown that. You've shown us the fact that in 1963, the railroads only raised the -- the escalation was .5 of a percent, which was very small. I'm sure that if I went back into the 1930's, I could show it going down, don't you agree with me?

A I don't know whether I can or not.

Q You mean that you don't know that freight rates went down in the 1930's? Haven't you studied this? Don't you know anything about trending?

A Oh, I know that many things went down in a period of the 1930's, but whether it went down for the whole decade, I can't say that.

Q Well, all right, the point is that you had to trend the coal costs, the coal transportation costs, up 4% in order to reach the result you reached, didn't you?

A That was the number that we thought was a reasonable number.

Q Okay, show me in Exhibit 22 where you trended interest costs up and at what rate. Maybe you did. I don't know your exhibit very well. I'd like to know where, in Exhibit 22, you trended interest costs.

A We didn't.

Q Don't you think interest costs are going to escalate in the next 37 years?

A I would expect that there is a possibility of that.

Q As a matter of fact, if you took the period from 1960, as you did on Table 12, until 1973, and showed the escalation every year, you might come out with a 4% escalation, mightn't you?

A Yes, I guess prime rate has changed that much in the same time frame.

Q It certainly has. It was lower than 4% or 3% on prime rate bonds back in 1961 and 1962, and they're now 9 and 10 and 11% for this type of utility, so I'd say that's more like 3 to 1, wouldn't you?

A That is correct, but --

Q Have you trended interest --

MR. BELLINGHAM: Now, now, now! Please! He didn't finish answering the question.

MR. GRAYBILL: Excuse me. Finish up what comes after.

A I think that if I understand the methodology employed by utilities in funding these plants, they go to the financial market and obtain money at a fixed interest rate for the life of a bond. I'm not aware of bonds having a variable interest rate, at least, yet. I've heard talk about it, but I'm not aware of it ever coming into practice.

Q And then, they also do that periodically from time to time, don't they? You've figured in this study that there's a 50% imbedded capital, right, in bonds? You've got a 50-50 debt ratio here, right?

A That's the assumption that's made, but it's also assumed that they go to the market on say, theoretically, one occasion, and borrow money at a fixed interest rate for the life of the bonds.

Q Well, certainly, I understand that. I hope you do, but do you understand that the whole billion dollars here is going to be borrowed in one fell swoop by these companies? Is that what you're saying?

A I would think that would be a poor way to obtain their financial assistance.

Q More likely, they're going to borrow as they need it, aren't they?

A As they need it.

Q So it's going to take them at least six or seven years to get it borrowed, isn't it? That's what they tell us it's going to cost to build the plants from now on.

A That would probably be quite rational.

Q And don't you suppose they've been borrowing money in the past for the last six or seven years?

A I agree with you.

Q As a matter of fact, I can tell you that in the case of the Montana Power Company, they've been borrowing it for a long time, and every so often, not every year, but every three or four years, some of their bonds come up and they have to be refinanced. Now, when they refinance them, they have to be refinanced at the new market, don't they?

A At the current market.

Q So if you say that financing this plant gets a fixed rate of interest, you're simply ignoring the fact that the money that could pay off this plant then has to be used and reborrowed at a higher rate instead of from the old indebted interest; in other words, their cost of money goes up just exactly the same as freight rates go up, doesn't it, or at least, it has, historically?

A No, I don't know that I'll agree necessarily with that. I would say bond interest from year to year is going to vary at the time they enter the market.

Q Well, where is your study in Exhibit 22 of the escalation of interest rates, which is going to affect the financing of these utilities?

A You won't find it.

Q That matches your escalation of the coal?

A It is not there.

Q But it isn't there because it doesn't exist, it's not there just because you didn't want to put it in the exhibit, isn't that right?

A No, it's not.

Q I mean, are you prepared to testify that the interest rate
isn't going to continue to rise?

A No, I am not prepared to say that.

Q Mr. Burns isn't prepared to say that, so I presume you are not?

A No, I'm not prepared to say that.

Q Well, then, we really have compared apples and oranges. We have compared coal costs, assuming a certain escalation, to interest costs, assuming no escalation, isn't that right?

A Yes, we used a constant interest rate.

Q That's fine. Now that we know the basis on which you do it, we can understand readily why you achieved such marvelous results, because you just haven't compared the same thing.

MR. BELLINGHAM: We move to strike the gratuitous comment of Mr. Graybill once again, as incompetent and immaterial.

MR. GRAYBILL: Which part of it is gratuitous, that it's a marvelous result?

HEARING EXAMINER: It will be stricken.

MR. BELLINGHAM: I'm referring to the entire output of Mr. Graybill, not any particular part.

MR. GRAYBILL: Okay, you may strike it.

Q Now, let's go back to your statement on page 6 --

HEARING EXAMINER: I have a request from the Court Reporter that it would be much easier if you would speak one at a time.

MR. GRAYBILL: I'll be able to do that if Mr. Bellingham stays out. If he gets in, I may have to talk over him.

Q Your counsel read to you a line on page 6, line 17, out of your statement, that the exhibit was performed under the most conservative basis with coal shipping escalations for fuel kept below actual escalation. Now, that's what we've been talking about, but the next sentence says: In addition, wherever possible, small advantages were credited to the remote site alternative. Now, the remote site alternative is Spokane and Hot Springs, as I understand it, and I just want to clear up and see if I understand you -- you're saying, on page A-11, Table 5, that in the remote site situation, which is the second half of your chart there, the Colstrip to Broadview 250 kv double circuit line cost $17,558,000, aren't you?

A Yes, sir.

Q And yet I read you the testimony from Mr. Greve, the engineer, who said that that line, not raised to 500, which, of course, you don't need if you're in Hot Springs or Spokane, is only going to cost $13,000,000 some odd dollars --

MR. BELLINGHAM: We object on the grounds it's repetitious and improper re-cross. It's the same questions asked him on cross and we did not go into them on redirect.

HEARING EXAMINER: Overruled. He can answer.

MR. GRAYBILL: As a matter of fact, Mr. Bellingham, you asked him this specific question yourself on redirect, and you asked him if the convertible feature --

HEARING EXAMINER: I've overruled the objection, so he can answer the question.

Q So the point is, then, that although Mr. Greve says that that line is only going to cost thirteen million and some odd, you put it in at seventeen million and some odd, haven't you?

A I'm not privy to the report you're referring to, sir.

Q Well, this is his testimony in this case when the 230 kv line was put in before this same board. He testified that that's what it would cost. I think counsel will concede that the convertible feature costs the difference. I can produce again from my office out here the testimony, but the fact is, that you see, up at the top you've got -- the second item -- at exactly the same price as you've got it at the bottom half of the chart. Do you see that, and in one case it has to be converted to a 500 kv line and in the other case, it doesn't, and the difference is about three or four million dollars, and I'm simply saying, pointing out, that you've included the four or five million dollars in the remote site case absolutely in derogation of your statement that small advantages were credited to the remote site. The fact is, the small advantages are taken away from the remote site, weren't they?

A No, I will not agree that the small advantages have been taken away from the remote sites. I think, that as I pointed out to Mr. Sheridan this morning, there were several instances where we gave significant credit to the remote sites. I direct your attention, to repeat myself --

Q Mr. Pettibone, just a moment. I would like you to keep your question on to the 230 kv lines situation, which you are not. If you have some small credit that's given there, I'd like to know about it, but I'd rather you didn't just relist something in another question that I haven't asked you about.

HEARING EXAMINER: You asked him about small advantages to the remote site, didn't you, Mr. Graybill?

MR. GRAYBILL: I asked him if this 230 kv line wasn't a small advantage that did not go to the credit of the remote site. That was my question.

HEARING EXAMINER: Okay, can you answer that question?

A In the case of the remote site, we did put a penalty against Colstrip for the conversion to the 500 kv line, and that factor of $848,000 is shown on the transmission costs leaving Colstrip, so that doesn't appear again in the Hot Springs or Spokane situation.

Q Yes, you're quite right, Mr. Pettibone. Now, do you understand that the $848,000 figure is for the service of the labor when they go out and change the configuration of the wires to move from 230 to 500 kv, do you --

A Yes, they're reinsulating the line.

Q Do you understand that?

A Yes.

Q Now, then, there is, according to the engineer, Mr. Greve, being the head of the office that did the engineering, there is a three to four million dollar differential in the cost of the line originally in order that it be convertible. This is for putting it on steel towers instead of putting it on wood towers and a lot of other associated differences.

A That could be.

Q And you have not given credit for that to the Spokane and Hot Springs case, have you?

A No, sir.

Q So you have inflated their costs by the amount that a steel tower line costs over a pole line, haven't you?

A In that instance, I guess I'll have to agree that that appears to be true. On the other hand --

Q Now, have I asked you a question about the other hand?

MR. BELLINGHAM: I think that Mr. Pettibone was not through answering, and I think he has every right to continue and answer that question.

HEARING EXAMINER: I'll agree. You agreed with the counselor, but you may finish your answer.

Q As long as it pertains to the 230 line, I certainly want to hear it, Mr. Pettibone. Go ahead.

HEARING EXAMINER: I won't know until he tells.

A I thought we were talking about the statement in my testimony that small advantages were credited to the remote site alternative more than just the matter you appear to want to dwell on in the nature of this 230 kv line.

Q You may be correct. Maybe a three to four million dollar error in your presentation is not a small matter. I don't know, but it seems to me that you have a clearcut error there and that's all I want to point out. Now, if you want to point out that there are other advantages, I take it you've already done that. I'm not trying to encumber the record by repeating them, but I am trying to point out, which I believe it is my duty to do as a cross-examiner that you've made a really serious error in the value that you've placed on the 230 kv line.

MR. BELLINGHAM: We move to strike once again Mr. Graybill's speech at this time on the grounds that it's incompetent.

HEARING EXAMINER: Well, I'll deny it. They're not on the same track, so we can cover that pretty well.

Q All right, let's go forward, if we can, Mr. Pettibone. On page 10 of your statement, in line 10, you say wheeling charges were computed in accordance with rate information received from the Bonneville Power Administration. Are you aware that Bonneville enjoys some rate advantages in terms of interest over private utilities?

A Yes, sir.

Q As a matter of fact, in an inhouse correspondence concerning transmission costs of one of the power companies here involved, the statement appears that federal annual cost ratios include the use of 6.78% interest with a composite value of approximately 8.3%, where as the composite annual ratio of 15% was assumed for private financing, and this is probably low. Do you agree that the composite annual cost ratio of private financing is about 15%?

MR. BELLINGHAM: We object to the question on the grounds that it's improper re-cross, exceeding the scope of the redirect.

HEARING EXAMINER: I'll sustain it on that grounds, but I'll let him reopen his direct if you feel that it's pertinent to your case.

MR. GRAYBILL: I would like to know whether he thinks that's a reasonable differential.

HEARING EXAMINER: Very well, I'll permit the question, but I recognize the propriety of your objection. You can answer the question.

A Maybe I could put this question in my own words. I am well aware that public power enjoys an advantage in their borrowing which is reflected in their fixed charges.

Q When you computed the wheeling rates, did you take advantage of that federal power interest rate?

A Sir, we did not compute the wheeling rates. We went to the BPA, a Mr. Weitzel, and we were advised what these charges would be and we show at the bottom of page A-13 in the report that that was the information and the numbers that were made available to us and were used in the report.

Q This memo that I just read you from is signed by Mr. Weitzel, so you agree, then, that the federal interest rate break does allow their wheeling charges to reflect that?

A Yes, sir.

Q So what you really have compared then, is a situation where you compare a plant involving shipped coal with no federal wheeling break and a plant where -- well, I'll withdraw that question. In computing the cost of shipping coal, there was no similar federal interest break reflected, is that correct?

A Well, in the course of shipping coal, I'm not aware of a federal agency that enjoys benefits of tax-free bonding.

Q That's my point. You understand that that's the case, right?

A Yes, sir.

Q What base rate for coal per ton did you use in that Exhibit 22?

A The freight rate, sir?

Q Yes.

A As I said earlier, we used the 9.5 mil per ton mile that had also been used by the Department of Natural Resources and escalated that from 1974, I guess it was. That's shown on page A-25 of the report, Exhibit 22, Roman Numeral V.

Q Page A what?

A A-25.

Q And what quantity of coal did you presume would be shipped in the first year?

A In the first year, again, I refer you to Table 10-A on page 26. Column 4 lists the tons of coal for each year, so to answer you, the first year is 5,818,000 tons.

Q Tell me again the exhibit number, the page number.

A A-26, Exhibit 22, column 4.

Q Where did you get the idea they needed 5,000,000 tons?

A I think a good agreement in the annual coal consumption that we have used with what was used in the Department of Natural Resources impact statement -- it may become clearer for you if you go to page A-24, where you will see the computations on coal consumption. There is shown there a calculation for -- that the plant would require 7,272,000 tons a year to operate at a 100% load factor. One of the criteria of the study said that for the first nine years the plant would have a load factor of 80%, and so 80% of the 7,272,000 is 518,000 tons per year.

Q Those figures were supplied you by the Montana Power Company?

A No, I think they were our own generation, but if I recall correctly, sir, they're in very good agreement with the Department of Natural Resources.

MR. GRAYBILL: All right, I think that's all I have.

HEARING EXAMINER: Anything further, Mr. Bellingham?

MR. BELLINGHAM: I hesitate to do this, particularly in view of the fact that they have a time limit on the getting out of town as far as reservations are concerned, and I think we've pretty well exhausted the subject, although my esteemed friend, Mr. Graybill, does not seem to be in the least bit exhausted at this time, but I do have a question or so.

MR. GRAYBILL: I think I'll ask that that be stricken from the record.

HEARING EXAMINER: It will be stricken, if it will help the time limit you're working under.

MR. BELLINGHAM: I move to strike the portion of my comments relative to "esteemed friend," and I will agree that it should be.

HEARING EXAMINER: Let's get going. Don't delay.

Re-redirect, by Applicants

By Mr. Bellingham:

Q The question was asked you relative to the escalation of interest rates in the exhibit and you testified that you did not

Q What base rate for coal per ton did you use in that Exhibit 22?

A The freight rate, sir?

Q Yes.

A As I said earlier, we used the 9.5 mil per ton mile that had also been used by the Department of Natural Resources and escalated that from 1974, I guess it was. That's shown on page A-25 of the report, Exhibit 22, Roman Numeral V.

Q Page A what?

A A-25.

Q And what quantity of coal did you presume would be shipped in the first year?

A In the first year, again, I refer you to Table 10-A on page 26. Column 4 lists the tons of coal for each year, so to answer you, the first year is 5,818,000 tons.

Q Tell me again the exhibit number, the page number.

A A-26, Exhibit 22, column 4.

Q Where did you get the idea they needed 5,000,000 tons?

A I think a good agreement in the annual coal consumption that we have used with what was used in the Department of Natural Resources impact statement -- it may become clearer for you if you go to page A-24, where you will see the computations on coal consumption. There is shown there a calculation for -- that the plant would require 7,272,000 tons a year to operate at a 100% load factor. One of the criteria of the study said that for the first nine years the plant would have a load factor of 80%, and so 80% of the 7,272,000 is 518,000 tons per year.

Q Those figures were supplied you by the Montana Power Company?

A No, I think they were our own generation, but if I recall correctly, sir, they're in very good agreement with the Department of Natural Resources.

MR. GRAYBILL: All right, I think that's all I have.

HEARING EXAMINER: Anything further, Mr. Bellingham?

MR. BELLINGHAM: I hesitate to do this, particularly in view of the fact that they have a time limit on the getting out of town as far as reservations are concerned, and I think we've pretty well exhausted the subject, although my esteemed friend, Mr. Graybill, does not seem to be in the least bit exhausted at this time, but I do have a question or so.

MR. GRAYBILL: I think I'll ask that that be stricken from the record.

HEARING EXAMINER: It will be stricken, if it will help the time limit you're working under.

MR. BELLINGHAM: I move to strike the portion of my comments relative to "esteemed friend," and I will agree that it should be.

HEARING EXAMINER: Let's get going. Don't delay.

Re-redirect, by Applicants

By Mr. Bellingham:

Q The question was asked you relative to the escalation of interest rates in the exhibit and you testified that you did not escalate these rates?

A That is correct, sir.

Q And the reason?

A I cannot think of a single study that we have been involved with -- that I have been involved with, or our company, in the time I've been with them, where we performed a host of studies involving money and interest and so forth, that we have employed a variable interest. It has always been for study purposes for comparing alternatives, one scheme against another. That has never been a variable; that has always been a constant. I'm not aware of others that do that type of study and introduce variable interest rates.

Q Now, then, you were asked a question relative to whether or not it was economical to ship coal to Boardman. Did this particular study involve the shipment of any coal to Boardman?

A No, sir.

Q Now, involved in every study of any particular locale or site or shipment or destination, and so forth, there are certain factors that apply to the study that a person is doing at that time? Am I correct in that?

A Yes, we try to build a fence around this criteria and study within the bounds of that fence, and that's what we did here.

Q Well, the criteria that are applicable to this particular study are not necessarily applicable to any study that may or may not have been made as to Boardman, is that right?

A Right, I agree with that.

MR. BELLINGHAM: No further questions.

HEARING EXAMINER: Mr. Sheridan.

Re-re-cross, by Department of Natural Resources and Conservation

By Mr. Sheridan:

Q In other words, you picked the parameters, ignore what's happening in the rest of the area, and call your criteria the only applicable criteria, is that right?

A I think the criteria we used is self-evident. I can only restate what I've said before, that we used much of the criteria that was used by the Department in their impact statement, and I explained the reasoning for it. Where we could agree that the criteria was rational, had credibility, we used it. To re-develop a host of new criteria would not have been prudent, because we would have been challenged on far more points than, we believe, we have been.

Q That's in your opinion?

A That's an opinion, yes.

MR. SHERIDAN: I have nothing further.

HEARING EXAMINER: Mr. Graybill?

Re-re-cross, by Northern Plains Resource Council

By Mr. Graybill:

Q Do you know the transmission costs per kilowatt hour from Colstrip on the transmission lines to Hot Springs?

A I heard your question. I'm trying to get --

Q Perhaps I should have said per kilowatt instead of kilowatt hours.

A I don't have the --

Q Let's make it in per kilowatt.

A If you wish to go back to Table 18, there we have the three schemes presented, and it would be easy to pull out the element of transmission, switchyard, and variables for the Hot Springs or the -- or any of these areas, and we can divide that by the billions of kilowatt hours and you can get it on an annual basis. Do you follow me, sir?

Q Yes. I don't have a calculator. I can't do it in my head.

A Can you give me a moment?

Q Surely.

A Which scheme would you like?

Q I want to know the transmission charge per kilowatt for Colstrip.

A All right.

(PAUSE TO COMPLY.)

A It appears that the transmission costs in the case of the Colstrip first year would be 4.26 mils per kilowatt hour.

Q How many kilowatt hours are you talking about?

A Was that a question?

Q Yes. How do you convert that to kilowatts?

A I thought you asked for kilowatt hours.

Q I asked for it per kilowatt and you gave it to me for kilowatt hour.

A I'm sorry, sir, I misunderstood the question. I cannot give it to you per kilowatt. That isn't the way my numbers are handy for me. All the energy in that table -- Table 18 -- all the computations were based on per kilowatt hour.

Q All right, and I understand you can't convert it now.

MR. GRAYBILL: That's all, thank you.

HEARING EXAMINER: Anything further? (No response.) Very well, I assume you have no objections to the exhibits? You still can make them if you want to interpose any. (No response). There being none, Exhibit 22 and Exhibit 23 will be admitted. You're excused, sir, and thank you for your appearance.

(WITNESS EXCUSED.)

HEARING EXAMINER: I want the record to show that I received public statements of witnesses who wish to appear at some time in these proceedings, from Daniel T. Potts, from Hoerner-Waldorf, William Berberet, from Vigilante Electric, Willis Wetstein, from Morrison-Maierle, Clinton Carlson, from the U. S. Forest Service, and S. L. Groff, from the Bureau of Mines, and I've had copies made and placed on counsels' table, and will do the same with any other written statements that I receive. Let's take a ten-minute break.

(HEARING RECESSED AT 2:25 P.M.)

Following a brief recess, the hearing reconvened at 2:35 P.M. on January 27, 1976.

HEARINGS EXAMINER: Let's proceed.

DR. HAROLD M. BEISEL, called as a witness by the Applicants, having been first duly sworn upon his oath, both as to his written direct testimony and as to the oral testimony to follow, was examined and testified as follows:

(THE WRITTEN DIRECT TESTIMONY OF DR. HAROLD M. BEISEL WAS DIRECTED TO BE INSERTED AT THIS POINT.)

Testimony of
Harold M. Beisel
Environmental Systems Department
Westinghouse Electric Corporation

My name is Harold M. Beisel and I am employed by the Environmental Systems Department of the Westinghouse Electric Corporation in Pittsburgh, Pennsylvania. I am a member of the senior staff management team of the Environmental Systems Department which is charged with the responsibility of assisting electric utility companies and state and federal agencies in evaluating and seeking constructive solutions to environmental and social problems associated with power generation and transmission. In my role in the department I am responsible in a supervisory manner for the conduct of social sciences personnel and socioeconomic impact studies. For the past four years during my employment in the department I have participated in and been responsible for the programs conducted by professionals educated and trained in the disciplines of sociology, urban planning, economics and social geography. I was personally involved in the planning, execution and review of the socioeconomic impact program conducted for the Colstrip Generation and Transmission Project.

I received a Bachelor of Science degree in chemical engineering from the University of Pittsburgh in 1964 and a Master of Science degree in chemical engineering from the University of Pittsburgh in 1965, after which I served as an officer in the U.S. Army, including service in the Republic of Viet Nam, during the years of 1965 to 1967. From 1967 to 1971 I taught at the University of Pittsburgh where I received my Doctor of Philosophy degree in chemical engineering in 1971. During 1971 and 1972 I remained at the University of Pittsburgh where I was responsible for an interdisciplinary analysis and development of mathematical models which describe the inter-relationship and interaction of an industrial system with the economic, social and political systems of a geographic region. I am the author, along with others, of various published studies which resulted from my research efforts.

The Environmental Systems Department was retained in February of 1973 by the five applicants in this hearing to perform an environmental impact analysis of the Colstrip generating Units 3 and 4. Among the environmental analyses which were conducted was an assessment of the socioeconomic impacts or changes likely to result from the construction and operation of Units 3 and 4. I was responsible for that portion of the environmental impact analysis dealing with the socioeconomic assessment. In fulfilling this responsiblity, I utilized several research people working under my overall direction. These individuals were educated and trained in the disciplines of systems engineering (responsible for mathematical modeling, fiscal/demographic models, etc.), social psychology (responsible for demographic analyses of population, age, sex, employment, etc.), sociology (responsible for analysis of social structure, social need, etc.), urban planning (responsible for analysis of the planning of the Colstrip community), and social geography (responsible for an analysis of personal preferences for geographic location).

The socioeconomic investigation was composed of two phases. The first phase included a quantitative assessment of the demographic and fiscal changes which would likely affect the services provided by and the revenues received and expended by local governments and the State of Montana during the construction of Units 3 and 4. The second phase was to assess the changes which had occurred during the construction of Units 1 and 2 and then project the likely socioeconomic changes which would occur during the construction and operation of Units 3 and 4.

During the first phase of the work, in which the demographic and fiscal changes were identified and projected, the methodology involved the use of computer models for demographic projection and financial impact analysis. Applicants' Exhibit 211 indicates the methodology used in summary form. The exhibit was prepared under my supervision, direction and control. Information about the proposed project, including the construction schedule and employment projections, were the primary inputs to the analysis. The employment projections and information about the current Colstrip and Rosebud County populations were used in the demographic model to produce population projections by age and sex. School enrollment projections were also provided by grade for the Colstrip school system. All of the primary information used was obtained from Montana Power Company, Western Energy Company, contract companies working on the project, various public officials in Forsyth and Colstrip as well as public documents obtained by the Environmental Systems Department.

A very critical assumption made in our detailed analysis specified that all of the people working upon the Colstrip project would come from outside the State of Montana and be located in the community of Colstrip. Thus, revenues and expenses generated by the Colstrip population and the requirements for community services would be in addition to revenues, expenses and services that would be generated if the plant were not built or if the total population would not reside in Colstrip. If in fact any of the workers came from within the region then they would not generate additional demands for services and only their additional income, depending on previous employment, would generate new tax revenues.

These assumptions were made to estimate the magnitudes of the maximum projections with regard to demands for services placed upon the schools, the county and the State. Thus, the detailed analysis is an estimate of the maximum socioeconomic impact. However, most of the tax revenues generated by the Colstrip project are due to the capital investment in the steam plants and the coal mined and do not depend upon the population.

During the second phase of the investigation, in which the impact of the socioeconomic changes which would result from the construction and operation of the Colstrip units were assessed, the Environmental Systems Department conducted a series of interviews with Montana State and local officials, Montana Power Company officials, residents of Forsyth, Colstrip and Northern Cheyenne Tribal Council in Lame Deer.

Work regarding the socioeconomic aspects was conducted in Montana from January, 1973 to November, 1973 and further work was conducted during February and March, 1975. It was during these periods that interviews were conducted.

The information obtained from the quantitative analysis, the interviews and reference documents obtained from the various public officials contacted regarding the socioeconomic changes which had occurred from the construction of Units 1 and 2, were drafted into the socioeconomic section of the Colstrip Applicants' Environmental Analysis.

As a result of our initial investigation in 1973 and the subsequent analysis in 1975, we find that the socioeconomic impact projected for the Colstrip area as a result of the construction of Units 1 and 2 has been less than we anticipated in 1973. This effect is a direct result of the fact that the analysis assumed that all of the new employees would be new residents of the Colstrip community. This did not occur for several reasons. First, of the 1400-man construction work force at the Colstrip site during construction of Units 1 and 2 in December, 1974, an estimated 66.3% of the workers had previously been residents of Montana. Nearly all of these workers left their wives and families in their permanent residences and commuted on either a daily or weekly basis. Thus, the number of new residents of the Colstrip region and the number of new students entering Colstrip and Forsyth schools were far less than the number originally projected by us and other environmental consultants. In addition, many of these new workers chose to relocate in a number of communities in the Colstrip area -- not entirely in Colstrip, itself. This resulted in a dispersion of the population and a lessening of the impact upon any single community. Thus, the housing and mobile trailer facilities provided by the prime contractor, Bechtel Corporation, and Montana Power on the Colstrip site were sufficient to accommodate those single workers and those married workers who left their families in home towns and chose to reside temporarily in Colstrip. As a result, there was no overcrowding of housing in either Colstrip or Forsyth. Investigation reveals that there were only 95 new utility hookups in Forsyth during 1974. During the first three months of 1975, there were only 6 new utility hookups. These latter facts reflect the conclusion that the impact of Colstrip Units 1 and 2 on adjacent communities has been significantly less than anticipated.

The second reason why socioeconomic impact has been alleviated is the extensive socioeconomic planning being implemented in Colstrip. Historically, the typical company town has exerted maximum political, economic and social control over its inhabitants while offering minimal housing facilities and amenities. However, Western Energy Company, a wholly owned subsidiary of Montana Power Company, is showing that the concept of a company town need not be an undesirable one. Responsible planning implemented in a conscientious manner has enabled Colstrip to be a community which is a pleasant, comfortable and desirable place to live. Mobile trailer facilities, single-family detached dwelling units, six to eight unit apartment houses, paved streets, sodded lawns and shopping and recreational facilities now available and under construction in Colstrip reflect the results of a substantial planning effort by Western Energy and Montana Power which few companies have attempted. Photographs showing typical housing units appear as Applicants' Exhibits 31 through 36. These photographs were taken by members of our staff and accurately represent the housing units involved. Applicants' Exhibits 31 and 32 portray single dwelling houses, Exhibits 33 and 34 show the front and back views, respectively, of the four-unit dwellings, Exhibit 35 shows the eight-unit dwellings and Exhibit 36 shows the commercial units. These photographs were taken prior to final landscaping of the area.

It should be noted that Colstrip is not far from communities in adjacent states where adverse impact has created socioeconomic disruption. Colstrip, in comparison, has experienced little adverse impact. Although community change and some slight disruption can be associated with the construction of Units 1 and 2, the construction of Units 3 and 4 is expected to create little additional impact. In fact, impact probably will be less than that experienced during the construction of Units 1 and 2 since civic leaders, public officials and citizens already know what to expect during the construction of Units 3 and 4. Thus, no new difficulties are likely to occur because all reasonably expected problems have been identified and corrected during the previous construction period. Of equal importance is the fact that physical facilities to provide community services -- housing, shopping, etc. -- are in place and available for use.

Six cities in the Colstrip vicinity were observed during the early part of 1975 to assess the changes which have occurred since 1973 and provide an updated assessment of those impacts which could be associated with the construction of Units 3 and 4. These communities include Forsyth, Colstrip, Lame Deer, Busby, Hardin and Miles City. Communities where population is centered in the Colstrip region were selected since they serve as indicators of socioeconomic impact as reflected by demands upon physical facilities and services. No significant adverse effects are evident that would be attributable to the construction of Colstrip Units 1 and 2.

Change in Colstrip is manifested in terms of new single-family detached homes and four-to-eight-unit housing complexes. In addition, a commercial center includes a new bank building and motel. All the newly constructed buildings are based on coordinating styles and earth hues such as tans, grays, browns and rust. Existing housing, built by the Northern Pacific Railroad (Burlington Northern), has been repainted to match the new structures.

Western Energy Company initially started its planning process for Colstrip Units 1 and 2 by bringing Ken R. White, an urban planning consultant firm, to the community. Working with Colstrip residents, the consulting firm outlined a master plan in 1972 to guide orderly but flexible community growth. That is, construction and expansion require both order to keep pace with population growth and flexibility to adjust to any unforeseen alterations in the growth rate. The Colstrip plan then provided for future growth in "pockets" surrounded by open space. This concept allows construction to be confined in one of several areas at a given time, depending on the demand for housing. The three types of housing specified (single-family, multi-family and mobile) also provided flexibility to meet the different housing needs of the population. Planning began with the decision to retain "old Colstrip" and plot its expansion, allowing ample space and facilities for a pleasant community. Exterior colors of both new and old homes were selected to blend with the natural surroundings. Parks, playgrounds, pedestrian-bicycle paths, athletic fields, green belts and recreation facilities were planned to compliment the community. While the new Colstrip has the advantages of company-sponsored city planning and preplanned construction of many community facilities, it does not have the typical "company town" lifestyle.

In addition, Colstrip has a mobile home park with more than 180 lots. Water, sewer and electrical hookups are provided. Existing dwellings in "old Colstrip" vary in size and condition. Reconditioning planned for the sixty-two older homes ensures that they will be comfortable and well-maintained.

Colstrip's population has created some over-extension of community services and physical facilities and temporary inadequacies in recreational facilities and aesthetic features. However, the completion of improvements now being implemented and the out-migration expected at the end of construction would create a balance in which community services and facilities will be adequate to the permanent population.

In addition to residential and commercial construction, Western Energy provided the opportunity for development of a community swimming pool, a movie theater and bowling alley.

What Western Energy has accomplished is a unique achievement in that few other mining companies have done as much for their workers in recent years. Colstrip has become such a desirable environment that Western Energy receives requests from miners working for other companies and from area ranch hands asking permission to move in. However, Western Energy is designing the town to accommodate its own workers who include construction workers, Montana Power personnel, commercial employees and prospectors.

Presently, Colstrip is an excellent example of how population can be accommodated without serious disruption. In fact, through sound planning principles, the quality of life in Colstrip has been improved.

Forsyth appears virtually unchanged since the start of construction of Units 1 and 2. Population has increased by only an estimated 875 people between 1970 and 1975. Along Interstate 90, the only visible signs of change, for example, are the expanded Sundowner Motel and the new Ford dealer. There are no visible indications of deterioration or overcrowding as a result of the Colstrip development; instead, the several new buildings in the downtown area suggest increasing prosperity.

Lame Deer appears to have been unaffected by the Colstrip development. Prior socioeconomic conditions remain about the same although there are Indians working at Colstrip. In addition, the Northern Cheyenne Tribal Council has postponed all coal-related development activities on Indian-owned land. The communities of Miles City, Hardin and Busby appear to be unchanged as a result of development at Colstrip.

With regard to the schools in the Colstrip area, initial school enrollment projections made by the Environmental Systems Department were intentionally overestimated to be high. This effect is a direct result of the fact that the analysis assumed that all of the new employees would be new residents of the Colstrip community, as discussed previously. Actual enrollment during January 1975, when the construction work force on Units 1 and 2 was reaching its peak, amounted to 522 students at Colstrip of which 206 were children of construction workers. At the same time there were 691 students in the Forsyth school system, of which 157 were children of construction workers.

Although both the Colstrip and Forsyth school systems presently have larger student bodies than at the start of construction of Units 1 and 2, the superintendents of the Colstrip and Forsyth schools report that a larger student body has not adversely affected their schools. In fact, a larger student enrollment has advantages because it allows for a more comprehensive program than could be justified if there were only a limited number of students. It should be noted that prior to energy development, low enrollment had made the cost of an expanded curriculum prohibitive.

As for adjustment difficulties for the new students, the superintendents have experienced few problems. Students from project-related families appear to be integrated into the permanent resident student body with children of construction workers actively entering into school activities.

Turning next to the employment figures relating to the Colstrip units, Applicants' Exhibit 24 is a graph titled "Manpower Loading Forecast" and shows the number of employees which are required for construction of Units 3 and 4. The figures shown in the exhibit were obtained from Montana Power and Bechtel Corporation. Exhibit 24 was prepared under my supervision, direction and control.

The figures on the left side of the exhibit show the total manual and nonmanual construction employment working on the Colstrip units for the years shown at the bottom of the graph. The total construction employment as to Units 3 and

4 indicates a work force commencing in the fall of 1976, escalating to a peak total of approximately 1,585 during 1979, and thereafter decreasing to zero as of fall of 1981 when Units 3 and 4 are expected to be completed. Of interest is the fact that the 1,585 total construction workers on Units 3 and 4 at their peak in 1979 is only approximately 130 more workers than on Units 1 and 2 at their peak during the spring of 1975.

Applicants' Exhibit 25 is a table titled "Annual Employment" and shows the average annual employment estimated to be required for the construction and operation of the Colstrip units along with the mining necessary to provide coal to support those facilities. The number of workers is shown in three categories as follows: (1) average construction (temporary), (2) operation (permanent), and (3) mining (permanent). The average number of workers shown in each category is based on an estimate of the yearly average for the years 1974 through 1982. The information for the preparation of Exhibit 25 was obtained from Montana Power and Bechtel Corporation. The exhibit was prepared under my supervision, direction and control.

Exhibit 25 differs from Exhibit 24 in that Exhibit 24 gives the estimated number of construction workers on a month to month basis whereas Exhibit 25 is based on an estimate of the yearly average of workers. The highest number of yearly average construction workers for Units 1 and 2 is 1,270 for the year 1975, the highest number of yearly average construction workers for Units 3 and 4 is 1,505 for the year 1979. Units 1 and 2 will require 86 permanent operation employees beginning in 1976 and Units 3 and 4 will require an additional 99 commencing with the year of 1980, creating a total operational force of 185. Although a portion of the operational force is expected to arrive on site prior to the years indicated in Exhibit 25, the figures reflect the total number of operational employees in the first full year of operation; thus, any overestimation of employment has been avoided and a degree of conservationism in estimating the benefit to the community has been provided.

It is expected that 95 permanent mining employees related to Units 1 and 2 will be on site by the end of 1976. Mining employment for Units 1 and 2 is expected to reach a maximum of 130 workers in 1979 and then decline to 72 workers by 1981. Mining employment for Units 3 and 4 is expected to reach a maximum of 150 workers by 1982 which brings the total work force to 222 miners for the year of 1982 and each year thereafter.

Total figures are also given in Exhibit 25 which indicate that the highest peak of employment, including all three categories, will be 1,721 workers during the year of 1979. The total permanent employees associated with all four units, including operation and mining, will be 407 for the year of 1982 and each year thereafter.

While Exhibit 25 provides an insight into the size of work force to be expected, it does not attempt to account for the maximum possible number of jobs generated because construction data has been averaged on an annual basis. Considering a peak construction employment of 1,585 in 1979 in combination with operational and mining personnel, the maximum number of workers on site at any time of the year is projected at 1,801. At the end of the construction period, the projection of 185 operational employees and 222 miners would constitute a permanent addition of 407 jobs to the local economy.

In addition to the requirement for construction workers actually engaged in work upon the plants themselves or engaged in the related business of mining coal, additional construction workers are going to be needed for the construction of transmission lines and substations to be utilized by the generating facilities. It is estimated that the overall project will use approximately 1,400 man-years of labor for construction of transmission lines and substations. In effect, this is equivalent to 280 men working on the average of five years each. The work force to be utilized upon the transmission lines will be distributed over approximately 400 miles so that geographically concentrated employment benefits are unlikely. Of the total of approximately 1,400 man-years of labor, approximately 1,200 man-years will be devoted to the transmission line projects with the remainder devoted to the installation of substations.

It is expected that labor turnover in the construction of the Colstrip plants and associated facilities will be low. The construction schedule of Units 1 and 2 is close to being on schedule and any minor delay has been caused by delivery problems in materials and supplies. The socioeconomic conditions existing at Colstrip, such as an attractive urban area, a good school system, shopping facilities and housing facilities, play an important part in the low labor turnover. In addition, labor turnover at Western Energy mines is one of the lowest in the mining industry. For example, between 1972 and 1975, 19 men or an average of 6 men per year, from an original labor force of 121, chose to leave their jobs with Western Energy. This turnover amounts to about 4.9 percent per year, one of the lowest rates in the industry. The reasons cited for the low turnover are the pleasant working and living conditions as well as the various urban amenities found at Colstrip.

The wages and salaries associated with the new jobs created by Units 1, 2, 3 and 4 provide stimulus to the local economy. Applicants' Exhibit 26 is a table titled "Average Annual Wages and Salaries" (in thousands of dollars) and shows the increased income related to the construction and operation of the units as well as the mining employment associated with the units. The construction income is based on the straight time rate of $8.10 per hour average wage in effect as of February, 1975 and the permanent labor force income is based upon 1974 payroll records. Overtime pay has been excluded to avoid an overestimation of benefits. Exhibit 26 was prepared under my supervision, direction and control.

The highest average annual wage figure for construction (temporary) as to

Units 1 and 2 is $19,751,000 for the year of 1975 and for Units 3 and 4 is $23,403,000 for the year 1979. As to operation (permanent) wages, Units 1 and 2 are expected to generate approximately $1,198,000 annually beginning in 1976, with an additional $1,379,000 being added by the payroll of Units 3 and 4 in 1980. This increment is expected to increase total benefits to operational employees to $2,577,000 per year after all four units are in operation. The cumulative benefits of the operational employee payroll over the seven year period from 1976 to 1982 is expected to amount to $12,523,000.

The mining payroll related to Units 1 and 2 is expected to have a value of $1,583,000.00 in 1976. Units 3 and 4 are expected to add additional wages as shown on the exhibit and by 1982 the total annual mining payroll is estimated to reach $3,319,000.

The combined payroll of the construction, operation and mining work forces is expected to reach a peak of $26,767,000 in 1979, with a cumulative total of $130,697,000 from 1974 through 1982. The permanent annual payroll is expected to level off at $5,896,000 beginning in 1982.

One of the more significant benefits Rosebud County and the State of Montana will receive from the Colstrip project is the tax revenue generated by the construction and operation of the four units. The major taxes paid to the state are the severance tax, the corporation license tax, the resource indemnity trust account tax and the electrical energy tax. Applicants' Exhibit 27 is a table titled "Estimated Montana Tax Revenues" (in thousands of dollars) and shows the estimated revenues generated by the foregoing four taxes from 1975 through 1982. Exhibit 27 was prepared under my supervision, direction and control.

The first column in Exhibit 27 indicates in thousands of tons the amount of coal which will be utilized by Units 1 and 2 and Units 3 and 4 for the years 1975 through 1982. These figures appear in the exhibit because the severance tax is based upon the amount of coal produced.

The severance tax is a new tax passed by the Montana State Legislature in 1975 and replaces the old strip mine license tax. The new severance tax is imposed on each ton of coal produced in the state in accordance with a schedule based upon the heating quality (the British Thermal Unit (BTU)) rating of each pound of coal extracted, and is further segregated with different taxes applied as to surface mining and underground mining. The rating of the coal which will be utilized at the Colstrip complex is between the 8,000-9,000 BTU per pound range and because surface mining is involved, the tax is 34¢ per ton or 30% of the value per ton, whichever yields the greater amount of tax. It should also be pointed out that "value" under the applicable statute means the contract sales price. Revenues to the State are expected to reach an annual high of $9,980,000 for 1982 and each year thereafter, and are projected to result in a total benefit of $31,364,000 from 1975 through 1982. While 4% of this revenue is to be returned to Rosebud County annually prior to January 1, 1980 and 3 1/2% of the revenue is to be returned to Rosebud County annually following December 31, 1979, the remainder will go to the State where certain percentages are designated for specific accounts with the remainder going to the state general fund. The amounts going to Rosebud County will be $349,300 in 1982 and each year thereafter.

The corporation license tax is based on the net income of all corporations doing business in Montana. The current rate is 6.75% of net income or a minimum of $50.00. It is difficult to estimate exact value of revenues generated by this tax since the amount taxable depends on a variety of variables. For example, in addition to the quality of the coal extracted, the rate will vary not only according to the quantity of coal extracted but also in relation to variables such as productivity levels and equipment used. However, based on information available at this time, estimates of revenues generated by this tax are shown in Exhibit 27. There will be no tax levied in 1975 because of a taxable loss position of the corporation at the time. The estimated yearly revenues range from a low of $16,000 in 1976 to a high of $531,000 in 1982 for a total value of $1,222,000 over a seven year period from 1976 to 1982.

The resource indemnity trust account tax is levied on gross value of product extracted and is paid to the Trust and Legacy Fund of the State of Montana. It is a flat fee of $25 plus 0.5 percent of the gross value of the extracted product if it is over $5,000. An estimated rate of 1.5¢/ton is expected to yield a maximum yearly benefit to the State of $125,000 in 1982 and a total of $451,000 from 1975 through 1982.

There is also income accrued by the State from the electric energy producers' license tax. This is presently a tax of 1.438 percent on gross income from sales of electricity within Montana and is estimated to be approximately $962.50/MW of installed capacity for electrical energy consumed in Montana. The tabulated values given in Exhibit 27 assume that fifty percent of the installed capacity of 660 MW of Units 1 and 2 and thirty percent of the installed capacity of 1400 MW of Units 3 and 4 will apply to gross sales of electric energy within Montana. The yearly benefit projected in Exhibit 27 ranges from a low of $159,000 in 1976 to a high of $722,000 in 1981 when all four units are in operation. The total revenue generated by this tax over a seven year period from 1976 to 1982 will amount to $3,077,000. Exhibit 27 also reveals that the total annual revenues paid to the State range from a low of $326,000 in 1975 to a high of $11,358,000 in 1982 with a cumulative total of $36,114,000 for the eight year period from 1975 to 1982.

In addition to those revenues paid to the State, Rosebud County will benefit from the Colstrip project through an increase in the property tax base. The increase in the property tax revenue from the Colstrip generating complex is shown in Applicants' Exhibit 28 titled "Projected Impact on Rosebud County

Property Tax" (in thousands of dollars). The exhibit was prepared under my supervision, direction and control. The tax revenues are based upon current projections of the actual value of the generation complex as provided by Montana Power Company and mill rates projected by the Montana State Department of Natural Resources and Conservation. Any deviation from the projected value of the generation complex or the mill rates will result in tax revenues to Rosebud County other than those shown in Exhibit 28. The annual property tax revenue increase due to the Colstrip generating complex ranges from $1,326,000 in 1975 to $7,962,000 in 1982 with a total value of $39,318,000 for the eight year period from 1975 to 1982. These revenues reflect a total generating complex value of $1,017,000,000.

There is also a gross proceeds tax within the county which is based upon the value of the coal produced from coal mines using the strip mining method. The annual gross proceeds of coal so produced are assessed at forty percent of their true and full value and the result is then subject to the mill rate against property county-wide. Applicants' Exhibit 29 titled "Projected Impact on Rosebud County Gross Proceeds Tax" (in thousands of dollars) shows the gross proceeds taxable value of coal to be utilized at the Colstrip generating units and the tax revenue increase for the years 1975 through 1982. The taxable values shown in Exhibit 29 reflect a maximum annual value of coal to be utilized at the Colstrip generating units for the years 1975 through 1982 as provided by Montana Power Company. The mill rates shown in Exhibit 29 are those projected by the Montana State Department of Natural Resources and Conservation. Any deviation from the projected taxable value of the coal or the mill rates will result in tax revenues to Rosebud County other than those shown in Exhibit 29. The annual gross proceeds tax revenue increase due to the Colstrip generating complex ranges from $46,000 in 1976 to $932,000 in 1982 with a total value of $2,624,000 for the seven year period from 1976 to 1982. Annual tax revenues for years subsequent to 1982 will be the same as those for 1982. The exhibit was prepared under my supervision, direction and control.

Applicants' Exhibit 30 titled "Projected Impact on Rosebud County Combined Tax Revenues" (in thousands of dollars) tabulates the revenues received by the county from both the property tax and the gross proceeds tax. The annual revenue ranges from $1,326,000 in 1975 to $8,894,000 in 1982 with a total value of $41,942,000 for the eight year period from 1975 to 1982. Annual combined tax revenues for the years subsequent to 1982 will be the same as those for 1982. The exhibit was prepared under my supervision, direction and control.

The Colstrip project will also provide benefits to communities outside Rosebud County due to the tax revenues associated with the two 500 kv transmission lines. The estimated construction cost of $199,000 per mile results in estimated combined property tax revenues of $4,482,500 per year to be paid to the sixteen counties between Colstrip and Hot Springs which will be crossed by the transmission lines. In addition, installation of switchyard equipment is estimated to cost $53,272,000 which would result in estimated combined property tax revenues of $659,725 per year. Thus, total property tax revenues in the sixteen counties are estimated to reach $5,142,225 per year as a result of the construction of the two 500 kv transmission lines and associated substations.

Although the benefits indicated above are indeed significant, another and important concern of the residents of Rosebud County and the individual counties along the transmission line route is the effect of the Colstrip project on the county mill levy rates. Estimates for Rosebud County, for example, indicate that the rate could decrease from the 1975 value of 98 mills without a sacrifice in the quantity or quality of county provided services. This is perhaps one of the more significant contributions that the construction and operation of the Colstrip units may offer to individual property owners.

MR. BELLINGHAM: At this time the Applicants offer into evidence Applicants' Exhibits 24 through 36, inclusive, and Exhibit 211.

HEARINGS EXAMINER: We'll reserve any ruling on it till the completion of your cross-examination, and then you can make any objections you have to the exhibits.

MR. CUMMINS: I assume that his statement has been accepted by the Hearings Officer.

HEARINGS EXAMINER: Yes, I have a copy of the statement. You may proceed, Mr. Cummins.

EXAMINATION OF HAROLD M. BEISEL

Cross, by Department of Natural Resources and Conservation

By Mr. Cummins:

Q Mr. Beisel, my name is Bob Cummins. Do you remember me from Pittsburgh last year on March 26th, or about that time, when we were deposing?

A I do.

Q If there are any questions that you don't understand the question of, if I make them unclear, do you understand that I would like you to ask me for a clarification? And you may be more comfortable, if you wish, by removing your jacket. This is a rather informal attendance in that respect. Will you tell me what the nature of your undergraduate and your post graduate studies -- what courses it was that you have that are in the sociological field?

A Undergraduate studies were limited to several courses in economics, an undergraduate course in sociology, sources in political science.

Q How many undergraduate courses did you have in sociology -- academic courses in the field?

A By name, one.

Q What was it?

A It was a general sociology course.

Q Have you ever had any academic courses in the field of social theory, as a discipline of sociology?

A No.

Q Would it be true, then, that you consider yourself a pure amateur social theorist?

A I would state that I don't have formal training in that area.

Q Well, I asked if you would consider yourself a pure amateur social theorist.

A I am not a social theorist.

Q Have you ever studied anthropology?

A No, sir.

Q And you have only had two undergraduate courses in introductory economics, is that correct?

A That's correct.

Q When did you first become associated with this project for Westinghouse?

A Shortly after the turn of the year 1973.

Q Was that at the time that Montana Power Company made the initial contact to have Westinghouse study Colstrip as the site for the environmental analysis?

A Yes.

Q Where was that contact made, in Montana or in Pittsburgh?

A There was a series of negotiations, of course. We were not the only consultant bidding on the job, and I was not in a lot of the prior negotiations. My first actual involvement was a trip to Butte, Montana, with several other professionals and managers in my department.

Q When would that have been?

A I believe in January of 1973.

Q When was the contract with Westinghouse firmed up?

A I believe there was at least verbal commitment in January of '73.

Q Do you know the amount of the charge that Westinghouse has made to this group for the study that it's done?

A I recall the value of the base contract; yes, I do.

Q What was that?

A That was $740,000.

Q Well, there's been work done since the base contract. What's the total amount of the fee charged by Westinghouse of the applicants here?

A That I do not know.

Q Is it in excess of a million dollars?

A That I do not know.

Q When did you or any members of your staff first begin work on the portion that it is that you're testifying about?

A I believe that was January of '73.

Q What did you do then?

A We designed the studies that we were going to do and got our research team together to execute those studies, coordinated the effort with the utility.

Q When did you first then really begin to do the actual work, which I assume is, the end result is your statement that you've made?

A I would say shortly after a final coordination meeting in Butte in January of '73.

Q Did you come to Montana yourself?

A Yes, sir, I did.

Q When did you first come then? What was the nature and scope of your involvement?

A The first visit was in January of '73 for a coordination meeting with representatives of the applicants.

Q When was the next time?

A In March of '73.

Q Where did you go then?

A To Butte, Montana.

Q How long did you stay?

A Two days.

Q What did you do?

A Reviewed the project with the applicant, Montana Power.

Q So the first two meetings were necessarily along the lines of preliminary work, is that right?

A That is correct.

Q When did you next come to Montana?

A September of '73.

Q Where did you go?

A Butte, Montana, and Big Sky.

Q How many days were you here?

A About five.

Q How much of the time was taken up at the Big Sky meeting?

A Approximately two days.

Q What was the purpose of the Big Sky meeting?

A Presentation of the analysis conducted to date with federal and state agencies.

Q Can you give me the names of some of the people that were in attendance at that time that you recall?

A Mr. Christiansen, the Lieutenant Governor; Mr. Wicks, Mr. Sennett, Mr. Egan, Mr. Roys, Mr. Price --

Q Perhaps if you would identify the people by group or whom they represent, it might assist. Start over, please. From Lieutenant Governor on, if you can.

A Mr. Christiansen, the Lieutenant Governor; Mr. Sallinarsh, Bureau of Indian Affairs; Mr. Binando, Bureau of Land Management; Mr. McChesney, Department of Intergovernment Relations; Mr. Wicks, Department of Natural Resources; Mr. Sennett, Department of Social and Rehabilitation; Miss Johnson, University of Montana; Mr. Egan, Department of Social and Rehabilitation; Mr. Roys, Division of Planning and Economic Development; Mr. Price, U.S. Forest Service; Mr. Mergen, Department of Agriculture; Mr. Draper, Division of Planning and Economic Development; Mr. Limberhand, Northern Cheyenne Tribe; Mr. Kologi, Department of Highways; Mr. Gallegor, Northern Cheyenne; Mr. Rowland, Northern Cheyenne Tribe. Those are some of the people outside the jurisdiction of the applicants and Westinghouse that were present at Big Sky.

Q Who from the applicants were present, do you recall? Mr.

O'Connor?

A Yes, sir, he was there.

Q Mr. Labrie?

A Yes, sir.

Q Mr. Evans?

A Yes, sir.

Q Mr. Hofacker?

A Yes, sir. Mr. Ross and Mr. Coldiron were there.

Q When did you next come to Montana?

A March, 1974.

Q On what date was it that the Colstrip generating and transmission project Environmental Analysis was printed and distributed?

A November, 1973.

Q Was it in formulated form, ready for printing in September of '73 at the Big Sky meeting?

A No, sir. Portions of it were. It was, of course, an evolutionary period, an evolutionary text.

Q Well, with respect to the sections of the environmental analysis regarding the socioeconomic aspects, was the work for that completed at the time of the Big Sky meeting?

A No, sir.

Q When was it completed?

A Approximately a month thereafter.

Q Where did you go in March of 1974 and what did you do?

A I was in Helena for a meeting with Montana Power Company representatives, as well as in Billings to discuss some of the results of the transmission line analysis with Dr. Clark from the Board.

Q The meeting in Helena, was that held at the Department of Natural Resources office?

A I don't recall.

Q Who was in attendance at that meeting? Was that a couple-day meeting?

A I believe it was about a 2-day meeting. I'm not sure who all was present.

Q Well, who was present from Westinghouse?

A Myself, Dr. Wahlquist, and others I'm not sure of.

Q Mr. Voytko?

A Perhaps.

Q Mr. Wright?

A I don't believe so.

Q Would you search your mind and envision who was there for sure with regard to Mr. Wright and Mr. Voytko?

A I don't believe so in March. I think perhaps the meeting you are referring to took place in April in Helena.

Q All right.

A And I was present then again, my next time in Montana, in Helena, during April, and at that time Dr. Wright, Mr. Voytko and others were present in Helena. That was a joint meeting of the Colstrip applicants with the Department of Natural Resources.

Q You said that you met in March of '74 with Dr. Clark?

A Yes, sir.

Q And that is the Mr. Clark that is a member of this Board?

A That's right.

Q Where did that meeting take place?

A In his office in Billings.

Q And that was in March?

A Yes.

Q Who was present at that meeting?

A Dr. Wahlquist, Mr. Anderson and myself.

Q Any representatives of the Montana Power Company?

A Mr. Anderson.

Q And what was the purpose and the intent of that meeting?

A Discussing some of the mathematical analysis on transmission line routing.

Q It was prompted, was it not, by Mr. Clark's letter to Westinghouse complaining about the methodology of study?

A Inquiring about methodology of study.

Q All right.

A Yes, sir.

Q For that word -- not only as respects to the mathematical calculations, but as to the micro or macro system of analysis that was used in the socioeconomic portion of the study, isn't that right?

A Negative. There was no discussion on the latter point.

Q He did not question that at all?

A It was not a topic of that discussion.

Q All right. Do you have with you copies of the correspondence that Dr. Clark initiated and sent to Westinghouse?

A No, sir, I do not.

Q Do you have copies of the correspondence that responded to Dr. Clark's inquiry?

A Not here today, no, sir.

Q Those copies are in existence and they are where, at Westinghouse?

A Of course.

Q How long was this meeting with Dr. Clark, several hours?

A Yes, sir.

Q Why was it that you people at Westinghouse singled out Dr. Clark to assist him in the inquiry that he had? Was it because of the result of his being a member of this Board?

A No, sir.

Q You did this for everybody that inquired about the correctness or challenged some of the comments of your analysis?

A I was not involved with project management of our analysis, and I was not involved in making the decisions.

Q That was not my question.

A I don't know what inquiries were responded to and how they were responded.

Q That was not my question. My question was, did you perform this service for any other citizens or anybody else?

A I did not.

Q Did Westinghouse deem it necessary to send anybody else to any individuals who had submitted such an objection or showed lack of knowledge about your methodology or your programming in this analysis?

A I do not know.

Q It would be a fair statement, wouldn't it, Dr. Beisel, that Dr. Clark was the only one that received such attentive treatment by Westinghouse that called for the sending of such high paid and high caliber to well-placed people who were inquiring about the socioeconomic aspects of this project?

A No, I would not believe so.

Q What was your position at the time that you came out and visited Dr. Clark?

A My position? How do you mean, position?

Q With Westinghouse? You were overall something of some section of this, which culminated in the production and presentation of documentation labeled "Sections 2.8," were you not?

A Yes.

Q And that's what Dr. Clark was talking about, wasn't it?

A No, sir.

Q He didn't talk about 2.8?

A No. Not to the best of my recollection. He talked about 3.9.

Q What did you have to do with 3.9?

A At the time I was manager of Systems Analysis, and included in that were people trained and educated in disciplines of socioeconomics, who were responsible to me in portions of Section 2.8, as well as engineers, who were responsible for the mathematical calculations involved in Section 3.9, the costs, selection of the transmission line routing, so that those people directly doing work on both sections functionally reported through me.

Q All right. And who else was it from Westinghouse that came out to talk to Dr. Clark?

A Dr. Wahlquist.

Q What did he have to do with the environmental analysis? What sections?

A He had the overall responsibility for transmission line routings.

Q Anyone else, did you say? I forgot if there was someone else.

A No one else from Westinghouse, Mr. Cummins.

Q What is Mr. Anderson's responsibility with Montana Power Company?

A What is his responsibility?

Q Yes.

A He's the manager of Environmental Affairs.

Q Who made the arrangements for the consultation with Dr. Clark?

A I do not exactly know.

Q Well, you weren't in a vacuum at that time. Did you?

A I did not.

Q Did Wahlquist?

A Perhaps.

Q Or Anderson?

A I do not know.

Q You can't say perhaps with respect to Anderson?

A Perhaps.

Q Who coordinated the trip? The Montana Power Company people?

A My efforts were coordinated by Dr. Wahlquist. The overall coordination of that meeting I am not sure of.

Q Well, as a result of the meeting with Dr. Clark, there was a letter written by him which in essence was a retraction of the complaints or the misunderstanding that he had with respect to those questions that he inquired of initially, is that right?

A Yes, sir.

Q All right. Next you came to Montana in April of '74, to Helena, I understand?

A Yes, sir.

Q And you were here for about a 2-day meeting, is that right?

A That's right.

Q During which time the proceedings of that meeting were taped on a magnetic tape system, do you recall that?

A No, sir, I do not.

Q Well, if I were to tell you that they were taped and there are tapes available of those comments and conversations, would you disagree with me?

A As I just stated, I have no way of knowing whether it was or was not. If you have tapes of those meetings, then I would agree with you that yes, they were taped.

Q All right. And who do you recall was present at that meeting, starting with the Westinghouse people, through the applicants, through the Department?

A Westinghouse people consisted, to the best of my recollection, of Dr. Wright, Mr. Voytko, Mr. Blenn, Dr. Sukoff, Dr. Edmonds, Dr. Wahlquist, myself.

Q Who is Dr. Wright?

A Dr. Wright is general manager of the Environmental Systems Department, Westinghouse.

Q He's in charge?

A Of our department, yes, sir.

Q And who is Dr. Sukoff? Where did he fit in the hierarchy?

A He was from the research laboratory, which we closely coordinated with and worked with on the project.

Q Did he report to you?

A For the function of this project, he did. Administratively, no.

Q I think that's all we're really concerned about, is who worked for whom and how the input got to where it is. When did you next come to Montana? Where did you go and what did you do?

A January of '75, Butte, preparation of Montana Power Company comments on a draft EIS.

Q You mean comments on the department's EIS?

A Yes, sir.

Q How long were you there?

A Approximately four days.

Q That's the only place you went?

A Yes, sir.

Q When did you next come to Montana?

A This week.

Q When?

A Sunday, the 24th of January.

Q Where did you go?

A Billings, Colstrip, Helena.

Q How long were you in Billings?

A Sunday, the 24th.

Q That's just an arrival point?

A Yes, sir.

Q When did you go to Colstrip?

A The 25th.

Q Did you drive down?

A Yes, sir.

Q How long were you in Colstrip?

A Most of the day, in the Colstrip vicinity.

Q What did you do at Colstrip? Who did you talk to?

A Martin White, Western Energy; Thomas McKeown, Superintendent of Schools.

Q Who else?

A That's all.

Q You didn't talk to anybody in any of the other communities around Colstrip? You said you were in the vicinity, and to me, that means Forsyth, Lame Deer, Ashland, Busby -- you didn't go to those places?

A I went to several of those places, but I spoke to no one in those communities.

Q You spoke to no one?

A That's right.

Q You made a windshield survey of the area, is that what you would say? You looked at it out through the windshield of your car?

A Yes, sir.

Q And what did you see? You just don't drive down there just to go look at the scenery. What did you go to see?

A I was looking at housing, temporary permit housing, commercial facilities.

Q And that was in preparation for your testimony here today?

A Yes.

Q Did you ever go to Colstrip before?

A Yes, I did, during the first visit to Montana in 1973.

Q That was in the winter -- January of '73? So you went to Butte and Colstrip?

A Yes, sir.

Q How long were you in Colstrip the first time?

A I believe it was one or two days.

Q And that was what we would term a guided tour, meaning you weren't just turned loose to get in the car and ramble? They showed you --

A In part, yes, sir, Mr. Cummins.

Q Well, this last time, were you given a car and did you just ramble, or were you guided?

A Both.

Q Okay, who guided you? This last trip?

A Mr. White.

Q He did the actual driving, or did you do the driving?

A I did.

Q Did you make any notes of your last visit to Colstrip, Forsyth, Ashland and Busby?

A Yes, sir.

Q Do you have those with you?

A Yes, sir.

Q May I see them, please?

A Surely. (Witness complies)

MR. CUMMINS: I would request that we be allowed to copy these particular notes which he has made at some leisure time, in order to expedite this and move it along, as there may be some -- with the view in mind of inquiring about these matters.

HEARINGS EXAMINER: When would you suggest that would be? I was hoping we would complete his testimony.

MR. CUMMINS: I would hope that, too, Mr. Examiner, but it's entirely possible that we may not.

HEARINGS EXAMINER: Do you have any objection, Mr. Bellingham?

MR. BELLINGHAM: No, sir. As a matter of fact, we move the admission of these notes as Applicants' Exhibit 222 at this time.

MR. CUMMINS: To which I object wholeheartedly, implicitly, and with no proper foundation, and out of the scope of his direct written statement.

HEARINGS EXAMINER: Well, I am not admitting any exhibits until the completion of cross, anyway, so you can go ahead and make copies of them and I'll rule on the admission of them later.

MR. CUMMINS: My understanding of the rulings and the terminology of this proceeding is that these matters are to be submitted to us within seven days prior to the time of testimony.

MR. BELLINGHAM: Let me point out that Mr. Cummins --

MR. CUMMINS: Now, just a moment, Mr. Bellingham. I am not, like the rest of the counsel here, am the least bit pleased at being interrupted while I am still in comment, and it is my understanding that with respect to any of these matters, other than for purposes of impeachment, that I would have the right to look at these things, and I may not even desire to inquire on them.

HEARINGS EXAMINER: I have granted you the right, the copies will be made and there is no objection to them. So he can go ahead and make copies.

MR. BELLINGHAM: May I point out that these particular exhibits were introduced into the evidence by Mr. Cummins, himself, and accordingly, any remarks he has to make relative to foundation I think are superfluous.

(MR. CUMMINS AND MR. BELLINGHAM ENGAGED IN CONVERSATION)

HEARINGS EXAMINER: All right, now let's not have colloquialism on this thing. I'll rule on it subsequently. You'll get copies and both of you can use them as you see fit, then I'll rule.

MR. BELLINGHAM: I would say Mr. Cummins possesses a rather short temper today.

HEARINGS EXAMINER: Strike that, please.

Q Now, were there any other times that you have been to Montana?

A None that I recall, Mr. Cummins.

Q What was your actual participation in the preparation of the background material? Did you conduct any of the surveys or make any of the interviews, or have any input into the analysis from the standpoint of actual studies or work from field participation?

A I was not involved in any direct field participation. I was responsible for designing the program and analyzing the results.

Q In essence, then, you were the coordinator of this segment of this?

A Exactly, Mr. Cummins; exactly.

Q Who did the surveys that were done in correlation and relation to this project?

A Can you further define the word "surveys" for me, Mr. Cummins?

Q Opinion surveys, interviews.

A There were several different types executed during the conduct of this study, and that's why I'm asking for a further definition.

Q All right, for openers, there was an interview made on October 4th and 5th by someone. Who did that work in the vicinity of Colstrip and Forsyth?

A There were interviews conducted October 4th and 5th, '73, by Mr. David Myhra, who was directly responsible to me.

Q All right. Where is Mr. Myhra today?

A Where?

Q Where is he? He did the work?

A Yes, sir.

Q Where is he?

A Physically?

Q That's what that indicates to me, yes.

A Physically, to the best of my knowledge, today he is in Washington, D.C.

Q And he has not been with Westinghouse for some time?

A That's correct.

Q How long?

A Approximately four months.

Q Who else did any surveys conducted in the interviews, besides Mr. Myhra?

A Dr. Sukoff, to which I previously referred.

Q What did he do?

A He was responsible for Section 2.8.5, Survey of Public Opinion, and that section was executed under his direction. Several of the interviews -- surveys, as you would say -- conducted during the execution of that section were conducted by Dr. Liang. Additional surveys or obtaining of information were done by Miss Pat Owen.

Q Where is Dr. Sukoff? Who does he work for?

A As I previously stated, he is with the Westinghouse Research Laboratories in Pittsburgh.

Q Where is Dr. Liang?

A At the time of the study he was under the supervision of Dr. Sukoff. To the best of my knowledge right now he is a member of the faculty at the University of Hong Kong.

Q And has been for quite some time?

A Yes, sir.

Q Who conducted the whole public opinion poll? Dr. Liang?

A This was conducted under the supervision of Dr. Sukoff.

Q But who did the work?

A It was done by an independent research organization in Ohio.

Q What is their name?

A I do not exactly recall their name. Their name has been documented in the reports which have been previously submitted. I think it was a firm called "Home Research Opinion," or words something like that.

Q Who drew up the questions for them?

A Dr. Byrne, who is another individual responsible to Dr. Sukoff.

Q Besides yourself, is there anyone who worked on this section of the project on the socioeconomic aspects going to appear on behalf of the applicants and give testimony here at this hearing?

A No.

Q Considerable work was done just prior to March of 1975 with the view in mind of updating Section 2.8, is that correct?

A There was work done prior to March 1, '75, with the view to updating Section 2.8, yes, sir.

Q Who did that work, when was it done, and where was it done?

A That work was done by Mr. David Myhra and Mr. Richard Travis. It was done during a period February 26 to March 5, 1975.

Q And it had not been formulated and reduced to written form for publication at the time of the taking of your deposition, is that correct?

A That's correct.

Q What kind of work did they do? Did they come out and make additional interviews?

A Yes, sir.

Q How long were they in the Colstrip area?

A The dates I just stated. Mr. Travis and Mr. Myhra were in that area.

Q For a period of how long?

A Approximately eight days.

Q With whom did they conduct interviews?

A Mr. Harding, the Sheriff of Colstrip; Mr. McKeown, Superintendent of Schools, Colstrip; Mr. White, Western Energy; Mr. Fandrick, Western Energy, the Town Planner; Mr. Rodgers, Site Manager, Montana Power Company, Colstrip; Mrs. Cousins, Women's Leader, Colstrip; Mr. Rice, Planning Coordinator, Rosebud County, at Forsyth; Mrs. DeWald, School Secretary, Forsyth School System; Mr. Holmes, Miles City; Mr. Steiger, Rosebud County Planning Agency; Mrs. Truscott, Forsyth School System; Mr. Wahl, Forsyth School System; Mr. Williams, Montana Power Company; Mr. Edwards, Long Construction Company; Mr. Meyers, High School Principal, Colstrip; Mr. Waldon, Colstrip Project Superintendent, Bechtel Power Corporation.

Q No attempt was made to contact at that time any of the leaders of the Northern Cheyenne Tribe?

A That's correct.

Q Or any of the elected public officials of Rosebud County other than the Sheriff?

A That's correct.

Q What was the purpose of interviewing somebody in Miles City?

A For an opinion as to whether the Colstrip project was causing changes in the community of Miles City.

Q Who was that person in Miles City?

A Mr. Dean Holmes.

Q What does he do?

A I believe he's with one of the TV or radio stations in Miles City.

Q In what capacity?

A I believe he's a broadcaster.

Q He is the only one in Custer County that was contacted at that time?

A That is the only one that I have on the list which was prepared for me.

Q Well, if there have been others, as complete as the list seems, their names would have been included. Is that not correct?

A That seems very feasible.

Q That's your usual procedure, isn't it?

A Again, please?

Q That is your usual procedure, to be thorough in that respect and identify the people you contact and talk with?

A Yes.

Q How far is Miles City from Colstrip?

A Approximately 72 miles.

Q What did you inquire of Mr. Holmes about, specifically, with respect to whether or not Colstrip was affecting the Miles City area?

A Specifically, I do not know.

Q You don't know what these people did that were under your direction? You don't know what they asked this man?

A I don't know explicitly every question he was asked, no, sir, Mr. Cummins.

Q Well, what was the gist of it? What were they looking for? How many people were employed from Miles City?

A Yes, sir.

Q How many kids were in the Miles City schools whose parents commuted?

A Yes, sir.

Q Well, wouldn't the superintendent of schools of the Custer County School System be better able to give you that information than a newspaper or TV broadcaster?

A Perhaps.

Q Do you know how many people lived in the Miles City area that commute and work in the Colstrip area?

A Not specifically I do not.

Q Who does?

A Perhaps Mr. Waldon, the Project Superintendent for Bechtel.

Q Well, wasn't that the purpose of the trip, to spend eight days there to get that kind of information?

A Yes.

Q But yet it's not been communicated or transmitted or translated into your testimony, has it been?

A Not directly as an impact, no, sir, Mr. Cummins.

Q It isn't something that you thought was of importance or thought that we should know, is that why it wasn't included?

A Yes.

Q At that time you had knowledge, did you not, that both your study and the State of Montana's study was absolutely void of any meaningful contact with the Northern Cheyenne Indians, and yet you did not, when you sent these two men out here, have them make contact with any of those people, did you?

A Will you rephrase or restate the last part of that question again, please?

Q You did not have your two people who came out here, Mr. Myhra and the other gentleman, make contact with representatives or members of the tribe of the Northern Cheyenne Tribe during these eight days that they spent in the Colstrip region?

A They were not charged to do that, nor were they charged not to do that.

Q Well, why weren't they charged to do it? You knew, and everyone else knew at that time, that your report, as well as the State of Montana's report, was completely devoid of the consideration of the Northern Cheyenne Tribe, and the socioeconomic impact that this project would have on them, and you were trying to pull the gaps and plug the holes when you sent them out here.

A We were trying to determine the impacts which had occurred in the area from Units 1 & 2 to project what would happen from Units 3 & 4, should they be constructed.

Q Does that mean, can I imply or infer from that that the project 1 & 2 has had no impact on the Northern Cheyenne or the ranchers in the community, or the other people that you didn't contact when you sent these two men out for eight days?

A No.

Q I'm puzzled at how it is that people got on the "to be contacted list" of potential inquiries being made to them by either a survey or interview. Who made that decision as to who your people contacted? Let's take the specific instance of October 4th and 5th of 1973. Who instructed that inquirer or that investigator to contact those specific people? How did he arrive at that decision?

A Those interviews were conducted as a result of discussions at the Big Sky meeting, particularly those individuals who were at Big Sky, and those were the first people contacted during that visit.

Q All supporters, no detractors, right?

A No distinction was made.

Q My, that's a remarkable sociological anomaly with respect to investigative responsibilities, isn't it? You're making a survey, you're inquiring about public opinion, and you're trying to formulate something, and all of a sudden nobody who is a detractor is inquired of. I'm referring specifically to your Environmental Analysis, Section 2.8, the footnote portion thereof, specifically footnotes 13, 14, 15, 16, 17, 18, 19 -- you're familiar with those, are you not? We've gone over these before.

A Yes, sir.

Q You talked to a Mr. Martins in Forsyth, First State Bank, Forsyth, Montana. He was interviewed by Mr. Myhra.

A Yes, sir.

Q Were there any records kept of those interviews, any notes or anything of that nature?

A I believe that we have discussed this before, and perhaps there were some handwritten notes kept by Mr. Myhra.

Q I might aid you, Dr. Beisel, in that what has gone before is not in the record here. I may seem to be belaboring this between you and I, but your counsel and yourself have deemed and selected to write 17 pages of commentary from what -- I can't remember -- a deposition of some 200 pages, and multiple examples and exhibits, and things. But those things are not specifically in this record at this time and will not be, unless they are offered, and so with regard to my in depth probing on these matters, what I know and what you know the question and the response is going to be, I'll have to have on the record, and I am inquiring about notations by Mr. Myhra from his October 4th and 5th interviews with these people. Were notes kept or made of those interviews, of some kind, magnetic tapes or comments by Mr. Myhra after the interview, or handwritten notes taken during the interviews?

A Speaking from secondhand knowledge, because I was not with Myhra during those interviews, but having been with him on other occasions on other projects, it is his custom to take handwritten notes during the conduct of the interview, and I assume that such notes were made during these interviews to which you refer.

Q With respect to second hand knowledge, why, that's what almost all of this stuff is, from everybody, because you're the one here who is putting ice cream on top of the pie. You're the one who is testifying as to what everybody else did.

A Yes.

Q And it is your usual operating procedure to do this, and it was Mr. Myhra's. You know of this custom that he had?

A Yes.

Q Is Mr. Myhra the one who lost his notes in a briefcase in an airport?

A This was in Buchanan, New York, to be specific, in the airport.

Q Yes, and he lost them after the Environmental Analysis was written, but before we had time to take his deposition?

A I believe so.

Q Well, tell me, how is it that Mr. Martins, Vice President of the bank, was selected to be interviewed by Mr. Myhra?

A I do not know specifically. He could have been referred to him by Mr. Wahl, the Superintendent of Schools, who was also one of the men selected for interview.

Q Well, how was he selected?

A Based upon our experience with similar types of projects, we were looking at areas which impact would reflect itself in, and one of those prime indicators is the school system, and so one of the first men that we would contact in any project would be superintendents of schools. So Mr. Wahl would be selected by the accord of his position.

Q Well, how is it that Mr. Martins gets to be an expert on development, economic and otherwise, on the Northern Cheyenne Tribe and the effect that Colstrip is going to have on Lame Deer?

A I believe you are referring to a text and a reference citation.

Q Correct.

A And I believe that that citation is incorrect. It is a typographical error in the report.

Q But you're not sure about that?

A No, sir, I am not.

Q Because Mr. Myhra's notes are in the Buchanan Airport?

A Or somewhere.

Q When did you first learn that the Ken R. White Plan was only made for Colstrip 1 & 2 and had nothing to do with Colstrip 3 & 4? When did you first become imbued with that knowledge?

A I believe that would have been in early spring, 1973, when we were accumulating research documents for our studies.

Q Before this analysis was written?
A Of course.
Q But the analysis doesn't reflect that, and neither does your testimony that you've given today, that the Ken R. White Plan is only for Colstrip with respect to Units 1 & 2, and there's no planning been going on, or no plans or programs with respect to 3 & 4 at the time you wrote this analysis.
A Is that a question?
Q That's a question, yes. Do you know that?
A Of course I know that.
Q Tell me, when did you first learn that the State of Montana didn't have a sales tax?
A I believe it was shortly after our report was published.
Q To refresh your memory, it would have been in the April meeting in Helena, when your boss, Mr. Wright, came back from having bought some tobacco at the store, and he commented, "My, isn't that curious, there's no sales tax in Montana." That was the first time the Westinghouse people knew that there wasn't a sales tax in Montana, isn't it?
A That's a possibility, yes, sir.
Q Well, I have a transcription as best can be done with respect to this matter, and I will represent that it is as good a quote as anyone can come up with, and it's marked for reference on these tapes, Reel something No. 189, and it's Mr. Wright talking. "As a matter of fact, I didn't discover you didn't have a sales tax until I bought some tobacco at lunch, and then I thought, 'Well, isn't that interesting, a state without a sales tax.'" Would that be a pretty close paraphrasing

of your recollection of Dr. Wright's comment about a sales tax in Montana?

A It could be, yes, sir, Mr. Cummins.

Q Well, that's in April of 1974, and you people have gone through in this 2.8 section, and you've prepared scales and diagrams and charts relative to taxes, and the effect of taxation, and the position of Montana in the eleven western states about taxation, and you didn't even know our damn tax base, did you, at the time of the publication?

A I won't say that that's entirely true. We did not state anything about a sales tax in our report.

Q You didn't, because you didn't know we didn't have one. You just took bulk tax rates and you tried to apply them, and you mixed us in with eleven western states, ten of which have sales taxes, when you came up with your per capita annual basis of taxation per person in Montana, isn't that right?

A That is the procedure reported in the report.

Q That's right. Isn't it a fact that when you people were contacted or you were contacting the applicants here that at that time the decision had already been made as to the site selection, that Westinghouse had really nothing to do with site selection? You were told to study Colstrip, and that's what you did?

A That is correct.

Q And for, in reality, whitewash, you looked at what were chipped in or thrown in to be some potential alternate sites for the location of these projects -- Colstrip 3 & 4?

A No, sir, I totally disagree with the word "whitewash."

Our function was to review the candidate sites as previously selected by Montana Power for their environmental compatibility in comparison with the Colstrip site.

Q Well, now, let's be frank. This study and your socioeconomic aspect weighs only the economic aspect and measures everything in dollars and cents, doesn't it?

A No, I don't believe that's true.

Q Oh? What social values have been measured in this study and in your testimony?

A Section 2.8.5 addresses those on a quantitative basis.

Q On a quantitative basis.

A Yes.

Q Well, now, let's get to this thing. Your study is on a micro rather than a macro basis, isn't it?

A Define your terms, please, in specifics?

Q Don't you understand the terms "micro" and "macro" as a sociologist?

A Not as a sociologist. I'm not trained in sociology.

Q Well, what are you doing here testifying, then, about the socioeconomic field if you're not trained in this field? You're just the administrator of the program?

MR. BELLINGHAM: We move that the question be stricken on the grounds it's argumentative and there's no probative value.

MR. CUMMINS: It has probative value if we're going going to get to foundation, then, if this gentleman doesn't know the basis of micro and macro as it's used in economic studies.

MR. BELLINGHAM: We move the comment just made also be stricken as speech not involving the question, argument, or anything else, and having no place in this proceeding, being argumentative.

HEARINGS EXAMINER: Well, I'm going to overrule your objection. He can tell what he knows about the two terms, or I think in accord with Mr. Cummins' opening statement, if he has any questions, he can ask Mr. Cummins for clarification, so you can tell him how you're using micro and macro, and then he can answer the question.

Q You were in attendance at the meeting in April in Helena?

A Yes, sir.

Q And there was a lot of comment and conversation with Dr. Gold and yourself and Sukoff and Wright and everybody else about the scope of your study, and the terms "micro" and "macro" analysis were used, were they not?

A Yes, sir.

Q And I believe probably your own testimony makes some distinction -- the written testimony -- makes some distinction between the two, does it not?

A Yes.

Q All right, will you tell me what kind of a study and analysis that you did in preparation of the Environmental Analysis and your testimony?

A Ours was a macroanalysis.

Q All right. And what is a macroanalysis?

A It's a large picture study, looking at an entity unto itself, not the individual elements of that entity.

Q The forest, not the trees?

A That is correct.

Q And what are some of the elements of macroanalysis that you used, the big picture?

A Aggregate budgets, aggregate populations.

Q And what would be an example of microanalysis?

A One individual's income.

Q Attendance at school in the Colstrip area, itself? For the Colstrip town? Would that be macro or micro?

A It could be either.

Q One group of people's opinions, such as the Northern Cheyenne, would that be micro or macro?

A That would be macro.

Q And you conducted a macroanalysis, but you didn't take a macro survey of the Northern Cheyenne, did you?

A No, sir.

Q Or of such a large group as the ranchers in the vicinity that are formed into a group? Would that be micro or macro?

A In the context of our study, micro.

Q So for justification of your analyses, you went to the macro system, which is evidenced by the survey done by the Ohio bunch?

A Correct.

Q Okay, let's talk about the Ohio study. Do you have your deposition exhibits with you, Doctor?

A I have my deposition. I don't believe I have all of the exhibits.

MR. CUMMINS: Might I for the record inquire what the hell it is that I'm getting from Mr. Bellingham at this time? Exhibit 221 -- previous to this time I got Exhibit 221, which is one sheet of paper, and now I get a sheaf of papers, it must be 50 in number, that are proposed as Exhibit 221.

HEARINGS EXAMINER: Well, you can put it aside. It's just a distribution of papers, I suppose, for --

MR. BELLINGHAM: That's right, for another exhibit. The previous exhibit was 222.

HEARINGS EXAMINER: This exhibit is not connected with this gentleman's testimony?

MR. BELLINGHAM: Yes, sir, it is.

HEARINGS EXAMINER: It is? All right.

MR. CUMMINS: My notation from an excerpt of his prepared text is 211. We've never been furnished with a 221 before this moment, the time being 3:38 on the 27th day of January.

MR. BELLINGHAM: My recollection is we haven't been served with any exhibits as yet.

MR. CUMMINS: My recollection is you're not entitled to any and we haven't started our testimony yet, and you'll get them in due course.

MR. BELLINGHAM: Well, I think you have failed to read the Court Order, of some time ago, as I recall.

HEARINGS EXAMINER: Well, let's continue with the cross-examination of this witness.

Q I'm referring to your deposition exhibits, and you have commented in your original testimony that you filed here today about a study and the questions that were asked by this interview company, in a long distance telephone call from Ohio to Montana. Can you tell me what hours of the day the telephone inquiries were made?

A Today I cannot.

Q Can you give me your best shot? Was it in the daytime, or the nighttime, or were they on Ohio time? Were they on Montana time?

A I do not know.

Q Well, they attempted to contact how many people by phone?

A I don't have any records before me, but I believe it was of the order of 500 to 1,000.

Q How about 1737?

A Perhaps that was the total number of people attempted to be contacted. I think the other number I referred to was the ones which were actually contacted.

Q Yes. The actual people who were contacted were 486.

A Around 500.

Q And the interviews were computed and completed on 502 people. Twenty-eight percent of those attempted to be contacted was the completed survey on, is that right? 502 of 1737, if my math is correct? I'm not too good at it, but --

A Assuming your math is correct, that would be approximate.

Q All right. And of that 1737 people, 140 of them chose not to participate in your poll, and 156 of them, the phone was busy; and 127 of them, their parents weren't home; and 636 of them, they didn't even answer the phone; and 176 of the phone numbers you decided to call didn't even exist, correct?

A If that's what the document in front of you so states, I would assume it is right.

Q I will represent to you, sir, that I would not as an attorney misrepresent this to you. If you desire to check, I'm sure your counsel has a copy of this exhibit. If you'd like me to show it to you, I will do so.

A It's not necessary.

Q Thank you. And isn't it a fact, also, that after you had 250 responses, that at that time you started to analyze the responses to the inquiries?

A That's correct.

Q You didn't even finish before you started analyzing, so you began to get a developed trend?

A That's correct.

Q Well, let's look at the numbers of the people that you actually did contact and where they were. Representatively, the worst numerical ratio was in Valley County. Do you know where that is?

A Say it again, please?

Q Valley County -- do you know where that is?

A Not specifically.

Q Well, generally, then, do you know where it is?

A No.

Q Do you know which way the wind blows in relation to Colstrip in Valley County?

A No, sir.

Q There were, at this time, on a population basis -- I assume you used a census study -- 11,471 people in Valley County, and do you know how many people you contacted in Valley County?

A No, sir.

Q One. One person. Do you have any idea of the lay of the distribution and the effects, the history, and the political applications, of the lay of the people where the responses were obtained from?

A I don't understand the question.

Q Well, do you think that Montana is a cohesive unit, like an apple? Or do you believe there are pockets of this and pockets of that, and people who believe differently in one area than from one other area in Montana?

A Probably a conglomeration of both.

Q Do you know the history of the political aspects, say, on a national basis for election of people to Congress from our various Congressional Districts? Whether one is Republican or one is Democrat?

A No.

Q Well, what did those people do when they came out here and spent all that time reading Montana history? They didn't find that out?

A I said I do not know that.

Q Well, did it reflect itself any in the material that you got submitted to you?

A No.

Q What I'm inquiring about is, the validity of this particular survey I think is exceedingly questionable, because of the fact that the distribution is inordinantly disproportionate to the areas involved.

MR. BELLINGHAM: We move that the remarks just completed be stricken as argumentative, not a question, nothing more than a pure speech.

MR. CUMMINS: If you'll give me a second, Mr. Bellingham, I'll make a question out of it.

HEARINGS EXAMINER: Make a question out of it then.

Q Do you agree with that or disagree with that?

A I disagree with that, and I believe that you have in front of your a research report in which there were statistical analyses done upon the data obtained from the survey, and correlating it with demographic distributions throughout the entire State of Montana, with census data --

Q That's just the point that I'm making. You take and let one person talk for 11,471 people in a county, and that's valid, according to your commentary.

A We do not single out that one individual one.

Q That's all you got. You didn't keep working until you got some more. You didn't say, "We should find out how many people live in this area, and proportionately, we should keep going until we contact 7 or 8," or, "We're going to have 1,000 people in this survey that we want responses from. There's 700,000 people in Montana. Each person should represent X number of people." Isn't that a survey?

A That's exactly what we did. We were looking at the results for the state. This is why we began to analyze after 250-some surveys were completed, and then we were establishing a hypothesis which we were testing against every additional piece of data that we got.

Q Then why didn't you call some more people in Valley County and get some more results from Valley County, so that one person didn't talk for 11,471 people?

A We were speaking of state opinions, and we were doing things on a random basis throughout the entire state. We were not focused upon an individual county or an individual community.

Q That becomes micro, versus macro, is that right? Looking at one county is micro, but looking at the whole state is macro?

A It could be interpreted that way, yes.

Q Yes. When did you first learn that there were 56 counties in Montana instead of 55? After the survey was taken? Because in April you didn't know that there were 56 counties. You thought there were only 55.

A We did not design our survey or the sampling procedure based upon the number of counties in the state. The delineation of the counties was really a reporting mechanism. The survey was done by telephone. Therefore, the distribution was done by area code and three letter prefixes.

Q How many telephones are there in the State of Montana?

A I do not know.

Q No idea, do you?

A No, sir.

Q You don't have any idea how many residential versus business telephones there are in the State of Montana, do you?

A No.

Q You don't even know how many telephones there are on the Northern Cheyenne Indian Tribe Reservation, do you?

A No, sir, I don't.

Q Would you assume there aren't very many, just from your general knowledge?

A I'd probably agree with that.

Q Let me give you another example of your testing procedures here. Do you know where Golden Valley County is?

A No, sir.

Q There are 931 people who live in Golden Valley, and you contacted two of them, and they all scored 100% on your questions. They answered them 100%, so there two people, representing 460 or 470 people, had as much weighted input as the one person representing 11,471 people had.

A No, sir. We were not taking results on a county basis. That was a delineation just of the data. The results were applied statewide. We were not attempting to survey individual county opinions, or the survey would have been designed and executed in an entirely different manner.

Q It's not that, but it has that result when you look at it from my end of the window, doesn't it?

A And that was not the objective of the study, either before its commencement, or in the analysis procedure at the end of the execution.

Q But it lends credence to the questionability and the validity of the inquiry made initially, doesn't it?

A No, sir, not with respect to the objective of that survey as it was designed and reported. No, sir.

Q Which county in the State of Montana has got the most telephones?

A I don't know.

Q A county with 11,000 people or a county with 981 people?

A I don't know.

Q That's incredible that you don't know that. How many telephones does the average family have in Montana? How many numbers?

A I don't know. I'd probably say about .7.

Q And your survey picked -- and 10% of the numbers that your survey picked, there weren't even any numbers for. 10% -- 176 out of 1700.

A As I said, this was done on a random dial basis, which is statistically valid. It was not taking a list of telephone numbers and selecting the ones you wanted to call. It was using a statistical sampling of random numbers.

Q You're aware of the dot system where you open a telephone book and you've got the computer sheet, and you lay it over it, and those that show up, you take and you call those people. You could do that, can't you?

A You could do that.

Q And that would have eliminated 10% of error, wouldn't it?

A Not of error. It would not have eliminated 10% of error.

Q You wouldn't have got a number that wasn't assigned, like you guys did.

A That's correct, but that does not change the validity of the survey for its intended purposes. It would have perhaps reduced the number of phone calls required in order to get the statistical significance we did achieve.

Q And you think 28% is a sufficient basis for a survey of this magnitude in Montana?

A For the results as reported, yes. The Harris Poll that enters the cover of Time Magazine uses 1500 people -- 1,500 people -- to represent 220 million people.

Q Do you correlate this group that you had to the Harris people?

A No, sir, but the Harris people correlates their 1500 to 220 million. We correlated our 500 people to the total populace of the State of Montana. It's exactly the same procedure, because it's founded in statistics.

Q Yes. Now, let's see. You don't know what time of the day they called. What's the population distribution in the State of Montana by sex?

A I don't know, but I believe it's reported in one of the exhibits before you, in comparing the statistical validity of our survey to the statistics of this state, as reported by census data.

Q How many census enumerator districts are there in Montana?

A I do not know.

Q Wouldn't that have something to do with it? Couldn't you use that kind of a system since you were working on a demographic basis, that you'd go to the census enumerator districts and pull so many people in each enumerator district?

A If we were looking for geographic distribution in the state or if we were looking for data by census district, yes. When you're looking for the aggregate in the state, no difference.

Q You're looking for public opinion.

A Of the state as an entity unto itself.

Q How many women answered thephone versus men?

A That's reported in a page before you. I don't have that page before me.

Q Seventy-five percent of the respondents to the inquiry were women.

A The report before you also goes into a statistical correlation of different answers by sex, and shows that there is no statistical difference.

Q Are you going to tell me in this day and age that the women haven't got a different idea from the men? Is that what you're saying, that you can take a formula and you can plug it in and come up with a differentiation factor on men and women's thoughts?

A That's what that survey and the statistical results say. Yes, sir, Mr. Cummins, and that data is before you.

Q Well, explain the anomaly, or maybe it isn't, of the Dawson County phenomena in this study. You know what I refer to?

A No, sir.

Q You don't?

A No.

Q You don't know that the results from Dawson County were alarming and required an asterisk for explanation?

A No, sir.

Q Well, now, there was a list in this study that's called "Citizen's Comments," and I don't know how many citizen comments there were that you people received. It goes from page 25 to page 31 and it looks like there's about seven on every page, and I'm wondering, did you contact personally any of those people, like the contact was made with Dr. Clark?

A To the best of my knowledge, no, Mr. Cummins.

Q Now I've got another section in here called "Data Records, Individuals, and Newspapers, Groups and Agencies." Do you recall that?

A Say again the title, please?

Q "Appendix II, Data Records. 1. Individuals and Newspapers; 2. Groups and Agencies."

A Okay.

Q Under "Individuals and Newspapers," item number 4 is Clark, William, Ph.D., Eastern Montana College, a member of the State Board of Natural Resources and Conservation, along with some other credentials. How did he get selected to be a member of this group as being an opinion former?

A Because of his position on the Board, of course.

Q Well, what was wrong with the other six members of the Board? Why didn't you contact them and put them down?

A They were not contacted, Mr. Cummins. None of the list in that appendix were people which were contacted.

Q Dr. Clark was contacted by you personally.

A On an entirely separate matter.

Q Having to do with the Environmental Analysis?

A Yes.

Q Having to explain away some inquiries that he had?

A Yes.

Q All right, and he was thought sufficiently important enough that you listed him as a member of an opinion forming group?

A Yes.

Q Or an individual. Can you tell me why your researchers omitted to include in their list of people and list of groups the Burlington Northern Railroad as being influential in forming opinions in Montana?

A No, sir, I can't.

Q How about the Anaconda Company? Why didn't you put them in?

A I don't know.

Q Do you know who they are?

A Yes, sir.

Q How about the political parties? You didn't put either of them in there either, did you?

A No.

Q Don't you think they have some input into forming opinion?

A Yes, sir.

Q You didn't contact them, either, did you?

A No, sir.

Q Did you think that the Burlington Northern wouldn't have an opinion about this, Colstrip 3 & 4?

A Of course they would have an opinion.

Q As a matter of fact, you were present during the last witness' testimony and you heard some of the things relating to shipment of coal in Montana, isn't that right?

A Yes, sir.

Q But of course, shipping the coal out of Montana after it's strip mined would not have the effect on the construction in

Montana of Colstrip 3 & 4, is that not right?

A It would have, perhaps, different effects.

Q Well, it would only be related to the mining aspects of it. It would not have anything to do with the construction of 3 & 4, if they ship the coal out of Montana?

A It would not have anything to do with the construction of Units 3 & 4. It may have effects due to the construction of additional rail heads, or transport of the coal, classed as rail heads, which may not be the case if Units 3 & 4 are constructed.

Q Did you contact the Milwaukee Railroad?

A No, sir.

Q How about some of the lumber and timber organizations? Did you contact them?

A I don't believe so.

Q They use electricity at the big pulp plants and sawmills in western Montana. They use electricity. Isn't that macro? Doesn't that cover the whole thing? Don't they have an influence on the forming of opinions in Montana?

A Yes.

Q But you mentioned the Montana Coal Council. You found them. Isn't that right?

A We did not ask these people anything. That is not a list of people that we went and talked to to get their opinions about any project.

Q I understand that, but you list them as opinion makers?

A That's correct.

Q And being influential in the economics and socioeconomics and history and political system in the State of Montana?

A That's correct.

Q And having a role in forming and formulating opinion?

A That's correct.

MR. BELLINGHAM: May I suggest, sir, a short break?

HEARINGS EXAMINER: Is that fine with you?

MR. CUMMINS: Sure, that's fine.

HEARINGS EXAMINER: All right. Let's take 10 minutes. Let's not take over that, so we can keep moving along.

(RECESS AT 4:05 P.M.)

* * * * * * * * * * * *

Following a brief recess, the hearing reconvened at 4:15 P.M. on January 27, 1976.

HEARINGS EXAMINER: Okay, you may proceed, Mr. Cummins.

CONTINUATION OF EXAMINATION OF DR. HAROLD M. BEISEL

Cross, by Department of Natural Resources and Conservation

By Mr. Cummins (continuing):

Q Dr. Beisel, is it correct that there is no subsequent study of the Cheyenne Indians from any source material undertaken since the time of the taking of your deposition, because there was none at that time?

A That's correct.

Q And is it not also true that there were no contacts with the Salish-Kootenai Tribe that were used in the preparation of Section 3.7?

A I'm not sure. I don't recall that I was responsible for Section 3.7.

Q Well, do you recall whether or not at the time of taking your deposition you made a comment with respect to that, that there were no contacts made with the Salish-Kootenai Tribe in the preparation of Section 3.7?

A I don't recall. Perhaps if I could see that section of the report it would refresh my memory.

Q Page 55, line 78, of your deposition?

A That's correct.

Q Isn't it also true that there are no sections in the Environmental Analysis which discussed the nonmonetary social costs of Colstrip in a quantitative manner? To assist you in answering that, page 87 of your deposition.

A I believe that school enrollments could constitute impact.

Q Excuse me. I didn't hear the word.

A School enrollments.

Q School enrollments?

A School enrollments could constitute impact, and they are not necessarily dollars, and they are quantified in the report.

Q But other than school enrollments?

A Population is quantified.

Q In a nonmonetary?

A Yes, just stating total population figures. Other than that, I don't believe there are others, Mr. Cummins.

Q Thank you. And isn't it a fact that Westinghouse did not initiate new site work? Its commitment was to review those located and identified by the client for environmental compatibility?

A That's correct.

Q Do you know how many residents there were in Rosebud County before the commencement of construction on Colstrip 1 & 2?

A Offhand I do not.

Q Do you know the specifically employable skills of the residents of Rosebud County or the Northern Cheyenne or any other Indians when you did this study?

A By crafts? No.

Q With respect to taxation, in your calculations that were made in your initial document in the Environmental Analysis, livestock was not included, is that not correct?

A I believe you are correct.

Q And also, no studies were done for the various counties that the railroads run across if the coal were to be shipped out of Montana. No studies were done along that line, either, were they? The taxable aspects?

A Nothing by Westinghouse, no, sir.

Q Do you know why there were not Salish-Kootenai, Cheyenne or Crow Indians on that list of people that were listed as influence or opinion makers?

A No, sir.

Q And you don't know why you left the Anaconda Company or the Burlington Northern off it, either?

A That's correct.

Q Was there any attempt made in your analysis to translate change in air quality into socioeconomic terms?

A No, sir.

Q Can you tell me, sir, why the following statement was made in your Environmental Analysis, contained on page 2-133, "As a major economic activity, agriculture has always followed the mining and timber industries in Montana." I am putting the "in Montana" on there to make it in context. Do you know why that statement was made? That is in Section 2.8.1.1.

A I believe that statement refers to dollar values of product produced, and so that looking at economic values of mining, economic values of timber, economic values accrued from agriculture, as an industry it would place third.

Q Where did you get that information?

A That's my interpretation of the statement.

Q Well, you're responsible for this section. Now I want to know where you got that information so that you can make that kind of a statement. I might say that that's what the statement means to me, too.

A I don't know specifically where that statement could be founded.

Q Well, I note that you footnote a lot of other statements, and I note that this doesn't have a footnote to it, and that it's always been an understanding of mine, as with many other people, that agriculture was first in Montana, maybe not in 1865, but certainly in 1973 when this study was done. Did you inquire of Maxine Johnson over at Missoula? I see she's mentioned in here. She knows a lot about a lot of things, and I wonder if you asked her about that.

A I don't know if that specific question was asked of her. We did have contacts with her.

Q Do you know whether or not that is a true and valid statement from the materials you brought with you, or materials and studies that you have?

A From the materials that I brought with me, no, I do not know that.

Q Well, if the situations were reversed, as I propose that they are, would that not have something to do on the socio-economic valuations that should have been placed in this study, either micro or macroanalysis? As to changing life-styles and things of that nature, that have a nonmonetary tag put on them? Or doesn't this positioning make any difference to you people?

A I don't believe the rank ordering of those three elements would change the results of our analysis.

Q I wonder if maybe you got the rank order because the state used to be known as the "Treasure State."

A Perhaps.

Q Your textual material says that your study was with regard to the environmental and social problems associated with the power generation and transmission. The power generation portions of your statement are limited pretty much to the Colstrip immediate area -- the town of Colstrip, the site of the plant, and the mine, is that correct?

A That's correct.

Q What did you do with regard to transmission studies, as far as socioeconomic impact or analysis under your contract with the applicants? How did you cover that?

A That's fully described in Section 3.7 of the applicants' Environmental Analysis.

Q But 3.7 isn't offered as testimony from you, Dr. Beisel, just your written statement, and I'm wondering, your written statement with respect to -- what did you do to assess the socioeconomic value of the transmission lines, besides putting a dollar sign on them?

A Determine the amount of workers required, and the geographic distribution --

Q Isn't that a dollar sign?

A Number of workers? No, sir.

Q Money is paid to them?

A Money that's paid to the workers is a dollar sign.

Q Well, you were present, I believe, through most of all of the people's depositions, and at one time during the deposition period, that four or five days when we were there in Pittsburgh, why, another slick, glossy, heavy-bound volume was brought out as another example of some of the work of Westinghouse. Do you recall that?

A Vaguely.

Q And one of those bound volumes had something to do -- and I can't find my notes, so I'll have to rely on your assistance -- it had something to do with a gas transmission line in Arizona, and it may have been El Paso Gas, or something like that, that I recall that you had something to do with the study on, where the transmission pipeline was going to cross an Indian Reservation. Do you recall that one?

A This was a study that we had done on a routing of transmission line for Tucson Gas & Electric.

Q Tucson Gas?

A Yes, sir.

Q All right, and it comparatively was about the same thickness, but a little bit smaller, in format layout as the analysis that was prepared for the applicants here, and you went through all of that study and when you got to the last two or three pages of it, there was a letter from the Tribal Council of that Indian Tribe. Do you recall that?

A No, I don't recall that in the report.

Q And that letter from that particular Tribal Council -- I don't recall the Indian tribe -- said that they did not give you permission, or did not give the applicants permission, to put the transmission line across their Indian Reservation. Then the next letter was to the applicants. It said, "Sorry, if the Indians won't agree, that's the end of it," and that was the end of the project. Do you recall that? That was the end result?

A No, I honestly don't. I don't recall.

Q You do recall the study?

A I recall the study.

Q And do you recall, and you are aware of, the necessary import of obtaining the Indians' permission of any reservation?

A Yes.

Q The necessity of them concurring in their lands being used in some fashion before any condemnation authorization under the treaty with the United States government becomes operative, you're aware of that?

A Yes.

Q And yet no contact was made by you in studying the Salish-Kootenai people, across whose lands, tribal lands, the proposed transmission lines are intended to pass, is that right?

A I don't believe that's correct at all, Mr. Cummins.

Q Oh, the transmission lines are not going to go across the Salish-Kootenai tribal lands?

A No, the fact that contacts, as you stated, had not been made. I don't believe that statement is valid.

Q What contacts with regard to the socioeconomic aspects of this was done by Westinghouse with the Salish-Kootenai Tribe? What studies?

A No specific studies.

Q Do you know what county in Montana the Salish-Kootenai Tribe resides in?

A No, I don't know.

Q So you wouldn't know how many of these telephone calls were made to Salish-Kootenai Indians, then?

A That's correct.

Q In Lake and Flathead County?

A That's correct.

Q And your study shows that you got responses from seven people in Lake County and twenty-five people in Flathead County. You don't know how many of them are Indians?

A No, sir.

Q Well, tell me about the contacts that were made with the Salish-Kootenai people by Westinghouse.

A Those contacts are delineated in the document which Mr. Bellingham passed out to you before the break, which was identified as Applicants' Exhibit 221.

Q The material I haven't had an opportunity to go through yet?

A Perhaps you have not had the opportunity to go through that, since it was distributed.

Q That is material that has transpired since the taking of your deposition?

A No, sir. Those are letters and reports of actions taken prior to the deposition, since the period Westinghouse was involved in this Colstrip project.

Q Do you know of your own knowledge whether or not the applicants or anybody acting for or on behalf of them, or Westinghouse, in any capacity, has received permission from the Salish-

Kootenai Tribe for authority to place upon their lands the transmission lines, as projected in this project?

A No, I do not know any involvement of that status.

Q What studies and information did you receive as to the socio-economic impacts of the transmission lines on the Salish-Kootenai Tribe?

A As I said a couple of minutes ago, none.

Q On page 3 of your written statement, line 7, "All of the primary information was obtained from Montana Power Company, Western Energy, contract companies working on the project." What contract companies worked on the project that you got information about, and was it only limited to the school system in Colstrip?

A Bechtel Power Corporation, for one. No, it was not related to school projections, whatsoever.

Q Should that then be a paragraph, a new paragraph, there?

A It could be, yes, sir, Mr. Cummins.

Q All right. Who were the various public officials in Forsyth that you contacted, and might I say that I view public officials to be others than notary publics, but to be people who are elected.

A I don't recall, specifically.

Q The Sheriff?

A I would believe so.

Q Where did you get the information with respect to the makeup of the employment figures that differentiates between the statement you made that all of the people working in Colstrip would come from outside of Montana? Where did you get the information that invalidated that statement, which was the basis for your initial analysis contained in your Environmental Analysis, printed in November of '73?

A Can you go back and start all over again and tell me what you want to know?

Q All right. Page 3, line 11, you say, "A very critical assumption..." --

A Correct.

Q "... all of the people working upon the Colstrip project would come from outside the State."

A Right.

Q Where did you get the information to invalidate that statement?

A That, for one, was obtained from Bechtel Power Corporation on surveys that they had done on their site personnel.

Q When you made the study and did your background work, were they not working on Colstrip 1 at that time?

A Yes, sir.

Q And what was the level of the work force on Colstrip 1 when you made your study?

A I believe around 400 people.

Q And at that time you did not seek to inquire of Bechtel as to the number of people they had employed and the residency of those people prior to the time of becoming employed by Bechtel?

A That's correct.

Q Would that have been a difficult thing, with only 400 people, to obtain that information, so you wouldn't have had to have made that type of fallacious critical assumption?

A Restate your question, please?

Q Would that have been too difficult to ascertain, the residency of those 400 people?

A No, it would not.

Q And that was a critical assumption, and it was a fallacious assumption?

A Yes, sir.

Q But since that time you have studied and you have found that two-thirds of the people who are working on this project are Montana residents, and from how many people did you have to go through to find the figures to ascertain that? 1800, or something like that?

A No, sir.

Q How many?

A We went through like 3 or 4, or half a dozen, to obtain the information -- not the source data. The source data was obtained from like 1500 people, by Bechtel. We obtained the data from Bechtel's management.

Q And you looked at 12 people out of 1500?

A No, sir. Bechtel looked at all people.

Q All right.

A Gathered the source data.

Q And Bechtel told you that two-thirds of their employees were prior residents of the State of Montana?

A That is correct.

Q So they looked at all of them?

A Yes.

Q Bechtel did the work; you people didn't?

A That is correct.

Q You state that "most of the tax revenues" -- by that do you mean that more than 50% of the tax revenues are going to be generated by the capital investment in the steam plants and the coal mined?

A Yes.

Q Do you know what portion of the figure, of the tax revenues to be generated by this, would come from other real property taxes, homes, cars, income tax, and things of that nature?

A I don't know a specific percentage, no, sir.

Q Once again, on page 4, with respect to the various public officials, I'd like to know who you contacted that you consider to be public officials with regard to establishing a socioeconomic change.

MR. BELLINGHAM: What line is that?

MR. CUMMINS: 8, 9.

A Mr. Bahls , Environmental Quality Council, Helena; Mr. Warner, Employment Security Commission, Helena.

Q Excuse me, Dr. Beisel. Once again, with the limitation and restriction that they are elected officials -- public officials? Not public employees.

A Mr. Christiansen, for one.

Q What did Mr. Christiansen tell you?

A Mostly to contact the other people, whose names I started to read. Other names I don't have before me.

Q All right, thank you. Do you know the number, or did you ascertain the number of vacant houses and buildings and commercial sites that were habitable or occupiable in Forsyth at the time that you commenced your study?

A Yes, sir, I believe I did.

Q And do you know now how many of them are currently occupied?

A No, sir, I don't.

Q Would it be a fair statement that there was an excess number of unoccupied homes and dwellings and business establishments available for occupancy in Forsyth's area before the commencement of construction and planning and work on Colstrip units 1 & 2?

A Probably.

Q How many new structures in the commercial area have been built in the Forsyth area since your original study?

A Very few. I don't know an exact number. I would say somewhat fewer than six.

Q Of what nature would they be?

A Expansion of the Sundowner Motel, a Ford dealership, I believe, or perhaps I believe there's another auto agency --

Q In other words, you've enumerated those in your testimony here, that you recognize?

A As somewhat representative, yes.

Q Now, you make a statement on page 5 that because of the responsible planning, and that it's been in a conscientious manner, it's enabled Colstrip to be a community which is a pleasant, comfortable and desirable place to live; do you recall that? Can you tell me, sir, by whose standards and what measurement system you used to make that statement? By the statement of the employees who live there?

A Yes, sir.

Q All of whom work for the applicants in one form or another?

A Yes, sir.

Q Would you expect them to say otherwise?

A Perhaps.

Q But not very likely?

A Not very likely.

Q No. Do you know the number of residents in Rosebud County in 1970?

A Offhand I do not.

Q Well, what was the general condition in Rosebud County; was it in-migration or out-migration before Colstrip 1 & 2?

A Out-migration.

Q For how many years?

A At least a decade.

Q Pardon?

A Probably a decade.

Q Page 2-133 -- wait a minute, 2-141, Table 2.8-14, was there any question that Colstrip units 1 & 2 were going to be built when you made your studies? Were they not under construction at that time when you were contracted with?

A Yes, they were under construction.

Q So the assuming is merely excess verbiage, then, in that heading?

A That table is incorrectly labeled, and I believe it's been pointed out several times previously.

Q What do you mean it's incorrectly labeled?

A It's incorrectly labeled. That is a companion table to the one below it, and both of those are quantitative data reflected in the figure 2.8-5, to the right.

Q But the figures stated in there are correct, aren't they?

A They are correct. So that the top chart should read, "Total Population Projected for Colstrip by age group, assuming all four units are constructed."

Q That's the bottom one.

A Wait a moment, please. I'm not finished. I'll say it again, then. "Total Population Projections for all four units, assuming 20% of the construction workers are single." And a proper title for Table 2.8-15 is "Total Population Projections for Colstrip for all four units, assuming 50% of the construction workers are single." So that in summary, as I have just said, those tabulated data refer and match the curves of Figure 2.8-5.

Q All right. But in 1972 you say that there were 770 people in Colstrip?

A Yes, sir.

Q Where did you get that figure? Did you count them?

A No, we did not count.

Q Did you use a census enumerator district?

A I believe that we did.

Q You did not do the demographic work on this; somebody else did?

A That is correct.

Q And that, you assume, is some kind of a factorized projection of the actual count in the 1970 Census, the last decennial census?

A Probably.

Q What increase percentage rate did you use?

A I don't recall.

Q What is your opinion about the increase percentage rate of population increase for the state of Montana since 1970?

A I have no idea.

Q Now, you did do a projected high, and this, of course, is based upon your initial schedule planned in the application, in 1977, of 5,079 people; and in 1982, which at that time I understand would be if Colstrip 3 & 4 are built, would be the end of the temporary and construction factor. They would be gone, is that right?

A Yes, sir.

Q And you have then an increase in population of 3,479 in Colstrip?

A Yes, sir.

Q From 770?

A Yes, sir.

Q Now, then, if all four units are built, you still have the 770 initial base?

A Correct.

Q But your high is 3,577 in 1982, for an increase of 98 over Colstrip 1 & 2?

A Negative. You just disregarded my comments about the chart, if you're still referring to page 2-141, about them being mislabeled. Perhaps you could just restate your question, Mr. Cummins.

Q My question is, is that when I take the numbers from the two charts, irrespective of 20% are single or 50% are single, you can have whatever assumption you want, what I'm interested in is the end product, the number of people that are going to be in town. There's going to be 98 more people in town after you build 3 & 4 than if you just build 1 & 2?

A That's not what those tables say.

Q That's not what those figures say?

A Table 2.8-14 is the population for all four units, assuming 20% of the construction workers are single.

Q Oh, you're correcting not just 1 & 2, you're correcting it and making it all four for both of those charts?

A That's what I said when I said about how the tables were mislabeled.

Q All right. Isn't that a rather crucial mislabeling of such an important product?

A A typographical error. The data are valid and correspond to the chart.

Q You recall me asking you very late into the night, section by section, if there were any errors?

A And I believe that this one was pointed out.

Q This one was not pointed out.

A If it was not pointed out, it was an oversight, Mr. Cummins. That error has been identified prior to my saying so right now.

Q Well, you didn't make that comment in your statement that you just filed here, did you?

A No, I did not. I didn't refer to those tables at all.

Q Well, the figures are interesting to me for another purpose, another reason, and that is the statement you make on page 6, line 21. "No significant adverse effects are evident that would be attributable to the construction of Colstrip Units 1 and 2," with regard to these particular communities. Is the key word there "attributable to"? Is that a semantical thing that we're playing with?

A The words are carefully selected, if that's what you're referring to.

Q Oh, I am. It's more than semantical; it's syntax, then, being modified by "significant adverse"?

A That's correct.

Q All right, tell me, what are the insignificant adverse attributable socioeconomic impacts that you have found from Colstrip units 1 & 2?

A One of the most significant ones -- one of the more important ones would be overcrowding in the school system, the use of temporary facilities.

Q What did you find when you were there the other day with regard to overcrowding in the school system? It still exists?

A Yes, it still exists today.

Q What? Kids going to school in the general store?

A Children are going to school in a commercial center, yes, sir.

Q I guess I don't -- I call it the general store, and you call it a commercial center. Okay. What else?

A I believe a lot of increased traffic on Route 315 at certain hours of the day, dust in the communities, noise, and somewhat a lack of shopping facilities --

Q Anything else?

A Those are the ones which come to my mind readily.

Q Okay, that's just in regard to Colstrip, and obviously, my reading of this statement is that you progressively extend this to the other communities; Forsyth?

A Yes.

Q What are some of the insignificant adverse attributable effects, socioeconomic effects at Forsyth?

A Some of the same ones -- essentially the same list.

Q Anything else?

A No.

Q Do you know what the gonorrhea rate was in Rosebud County in 1969?

A No, I do not.

Q Do you know what the gonorrhea actual count was in 1974?

A No, sir.

Q Did you bother to check with the State Department of Health the reported gonorrhea cases for Rosebud County at any time?

A No, sir, I did not.

Q Would you say that an increase in the gonorrhea rate is a significant adverse effect of Colstrip units 1 & 2 on the community, or would you say it is insignificant?

A It depends on whether it is, of course, attributable to Colstrip units 1 & 2.

Q Well, what else is going on down there besides Colstrip 1 & 2?

HEARINGS EXAMINER: Watch your language on answering this one. (Laughter)

A What I'm saying is that if you're reporting an increase in Rosebud County, I would like to know what it is doing in the county we're in now or the rest of the state, because perhaps what you're referring to is an increasing trend throughout the State of Montana, or is it specifically related and attributable, as you say, to Colstrip units 1 & 2, and can you so prove that?

Q Did you make a study -- now you're getting interested, like I thought you'd be interested for a study, but you didn't study this, and if I were to report to you that in 1969 there were 18 reported cases of gonorrhea, and in '74 there were 107 cases, and you don't know what else was going on down there to attract some -- I forget how many thousand people, it's quite logical that that is attributable to the influx of people, who are attracted there for the construction of Colstrip units 1 & 2, or the digging of the coal, which is an associate of Colstrip 1 & 2, is it not?

A Part of it is, not all of it.

Q But you didn't know about those figures?

A No, sir.

Q All right. Did you study the reported crime rate in Rosebud County?

A Somewhat.

Q What do you mean by "somewhat"? Did you ask the Sheriff how the crooks are getting around, or what? You talked to the Sheriff, and I just wondered.

A Yes, sir.

Q Do you know the rate of increase in crime since the commencement of construction of Colstrip?

A I have known something about the rate of reported crime.

Q Reported crime?

A Yes, there's a distinction.

Q Reported, that's all I'm talking about. I don't want to talk about anything that somebody didn't report. Did you make an analysis of that, study that? Do you know what the reported crime rate was before Colstrip 1 & 2 began and what it is now?

MR. MELOY: Mr. Davis, I didn't hear the answer to the question, as first given.

MR. CUMMINS: It had something to do with their knowledge of reported crimes.

MR. MELOY: Thank you.

Q Do you have any studies? Do you have any information on that? You didn't mention that in your text that you submitted today, did you?

A No, sir, I did not.

Q And do you think that a rise in the crime rate is an insignificant incident or it's not attributable? Where is the out?

A Perhaps somewhat of all other factors.

Q Well, on a scale of 90% being vertical and 180 being flat, would you be surprised if the reported crime rate since the initiation of the construction of Colstrip is rising at a rate, at an angle of approach between 75 and 80 percent, on a scale of 90 being straight up and down?

A I probably would not.

Q That wouldn't shock you?

A No.

Q You would expect that?

A No, I would not expect that, but from the data I've seen I presume that that could be the percentage of reported, and I must emphasize the word "reported," crime rate.

Q Oh, yes, I know that reported are those that you complain about, and the unreported are a lot more than the reported, aren't they?

A Correct. Could be; could be.

Q Well, nationally trended, the FBI and those people all say that they expect that when they get 55,000 rapes, they say there must have been 200,000 of them. It depends upon the particular crime. When I'm talking about crime, I'm talking about felonies, not misdemeanors. That's what goes into the reported crime system, isn't it?

A Yes.

Q Nobody reports the incidents of drunkenness or disorderly conduct, or DWI's, in the system that we have on reported crimes. Those are merely misdemeanors.

A They are kept at the local level.

Q Yes. You didn't check them anyhow, did you? You don't know how many more DWI's they've had down there since this whole thing started, do you?

A I have a fair idea.

Q But those are insignificant, or you don't attribute them to the Colstrip project; is that right?

A No, not exactly.

Q Well, who's coming down there besides people to go to work? You said it was an out-migration place, and the only thing that there is that's brought anybody there, you will admit, is Colstrip, isn't it?

A Yes.

Q So is it not a fair assumption, then, that these things are attributable to Colstrip, just the two incidents that I've just mentioned?

A Could be attributable directly to units 1 & 2, yes, they could have been.

Q More probably than not they are, isn't that right?

A I would have more confidence in the latter one than the first one that you mentioned.

Q But to be positive about it, you could have eliminated that by a study, couldn't you?

A I could have, yes, sir.

Q But you did not?

A That is correct.

Q On page 7 of your written text, line 19, the culminating portion is, "While the new Colstrip has the advantages of company-sponsored city planning and preplanned construction of many community facilities, it does not have the typical 'company town' lifestyle." Describe for me, sir, what is the "company town" lifestyle that Colstrip does not have.

A All the community activities planned by and executed by the "company," without any involvement of outside organizations.

Q Well, the company owns all the property, right?

A No, sir, they do not. There is a private developer building homes for private ownership right now in Colstrip.

Q Would did they buy the land from?

A From Western Energy Company.

Q From the company, right?

A But they are being developed by private entrepreneur ownership.

Q Right, now they are being developed?

A Yes, sir.

Q But at the time of your study they were not being developed, were they?

A At the time of the study, no, they were not. They are now, and as of the date of this testimony they were. The town has been platted with the county, with a view towards private ownership.

Q Well, how do you sell a town? Who's going to end up owning the sewers and the streets and the power lines and the gas facilities and the water works, roads? Those are going to all belong to the company.

A To municipal utility districts.

Q Formed by the owners or the people who own the property?

A Yes, sir.

Q Do you know of any incidences like that in the State of Montana?

A No, sir, I do not.

Q Who sets the price, the company? Or do they give it away?

A I don't know.

Q Well, what are the general amenities of a company town? Do you know of any other company towns someplace that you're talking about, besides Butte?

A Not specifically.

Q Well, I'm wondering what it is you compare this company to to some other company town. Is there one in West Virginia or Kentucky, or did you go to Bonner, Montana, or where did you go?

A Just generic qualities.

Q Well, the statement's a little more than a generic statement.

A It says "typical company town lifestyle," it doesn't say a specific one, with a comparison point by point.

Q What's a typical company town, then, generically? Describe one for me, and as you delineate those things, differentiate them between the one that you're thinking of hypothetically and the one that we're talking about structurally here, Colstrip.

A Complete ownership of all properties, and as I've just stated, that has somewhat changed in Colstrip; complete company organization of all activities in a community, complete company control of all social amenities within the community, of commercial retail outlets; those are changing in Colstrip. There are outside organizations, service organizations, in Colstrip.

Q Well, just give me black and white. What is the predominant ruling authority, the company, whether it's all black or all white, until it gets down into the halfway mark?

A Yes.

Q What over-extensions of community services has the increase in population created at Colstrip? You just say some over-extension. What are they?

A School space, for one; commercial facilities, health care facilities, roads --

Q How about Forsyth? Are there any over-extensions of community services at Forsyth?

A Somewhat in the school system, somewhat on the road network.

Q What does that mean to people, more taxes?

A No.

Q Well, what's happened to the mill rate in Rosebud County?

A It's decreasing.

Q Well, what was it when it first started and all these people showed up? How many mills?

A I believe about 140.

Q Now you make a statement on page 8 that, "In fact, through sound planning principles, the quality of life in Colstrip has been improved." Yet the Ken R. White Plan was only planned for Colstrip 1 & 2, and this only planned for Colstrip 1 & 2, but not 3 & 4, is that correct?

A The Ken R. White study makes the fundamental basis for units 1 & 2, which are easily expanded into units 3 & 4. There will be things like road networks -- perhaps, even a better example would be to take the water supply system. There was a new water supply system put in to support the Ken R. White Plan for units 1 & 2, and this has sufficient capacity to accommodate units 3 & 4, similarly with the waste water system and other of the basic fundamental needs of the community; so that the Ken R. White Plan sets the basis for units 1 & 2, but is easily expandable into supporting units 3 & 4.

Q But do you know Ken R. White doesn't know that itself? You didn't know until just recently that the Ken R. White Plan did not include 3 & 4, but only was limited to 1 & 2?

A No, sir. I said earlier this afternoon that I realize wholeheartedly that Ken R. White's study was only units 1 & 2.

Q What is your experience as a town planner? What do you know about planning? What's your background in planning? How many towns have you planned? How many subdivisions have you platted?

A None.

Q Have you every done any of that stuff?

A I have not directly; no, sir.

Q You say that Forsyth appears virtually unchanged -- unchanged as in relation to when?

A 1973.

Q It hasn't changed since '73? What did it do between '70 and '73? Did it change?

A I wasn't there in '70. I don't know.

Q Did you do a study? Did somebody go study what it was like in '70? You don't even know the population of Forsyth in '70, do you?

A Yes, we do.

Q You do?

A I do not. I said "we."

Q What was it?

A I do not know specifically.

Q Well, you say that it's only increased in population by 875 people. You had to compare that to something to make that statement here in this statement that you made -- page 8, line 16 -- 875 on top of 875?

A No.

Q 875 on top of what?
A I do not know.
Q Your statement's a bit misleading then, isn't it, because it's coupled with "virtually unchanged." If it had a 50% population increase, that's not virtually unchanged, is it?
A That's correct.
Q You're talking about the visible things; you mean the new buildings, but you don't know how many buildings were empty before this whole thing started, do you?
A I do not know specifically, no, sir.
Q You didn't bother to go see the Assessor in Forsyth, the County Seat of Rosebud, and ask him what the unoccupied building rate was?
A I believe that that was done.
Q Where are those figures? Where are those statistics to back up your statement that it's virtually unchanged? They're not in this statement that you've made, are they?
A No, sir.
Q How far is Hardin from Forsyth?
A I believe about 35 miles.
Q And how far is that, then, from Colstrip?
A Almost a like distance, about 30 miles.
Q And Busby?
A About 25 miles.
Q And they just appear to be unchanged?
A Yes, sir.
Q Did you do a study to find out whether they'd changed or not?
A No, sir.

Q This was a result of your windshield survey of these towns that you went through the other day?

A Previous surveys of a like kind.

Q What's the athletic classification under the Montana system of the school at Colstrip?

A I don't know.

Q What is it at Forsyth?

A I don't know.

Q But yet you make the statement that the superintendent of Colstrip and Forsyth schools report that a larger student body has not adversely affected their schools. Don't you think that's a statement better left for them than for you, if you don't even know what athletic class the school's in? Wouldn't a change in athletic classification have something to do with affecting a school, because it's directly related to the number of students you have, or didn't you know that?

A Of course. This is referring to the quality of education, and these statements are reflected from those superintendents of schools.

Q Well, the quality of education in Montana under our lifestyle includes our athletic programs for our kids.

A Sure.

Q And all of the things that you say that have come about at that school are all -- the expanded curriculum -- are all good. Do you know what the quality of education was in those school with regard to the 3 "R's", the reading, writing and arithmetic, before Colstrip got there?

A No, I do not, directly.

Q Well, was a study done on that? Was there a comparison and analysis done on that by Westinghouse or anybody under their supervision?

A By talking to the superintendent of schools.

Q You mean that's a gut reaction. I'm talking about a study, a first class study. You're a first class professional, and this is a first class professional company, and you didn't make a study on that. You didn't make a curriculum analysis or a student evaluation, how many kids go to college from there, what those are like in comparison to other students, how do they rank in speech meets, and stuff like that -- you didn't make any studies like that, did you?

A No, sir.

Q Are you saying that the quality and the quantity of the education that was offered in Forsyth and in Colstrip was inadequate because it had a low or different type of curriculum?

A Not inadequate, no.

Q They didn't have a drug education program in the school system down there until you guys got there, did they, with your Colstrip 1 & 2?

A No.

Q But they do now. Why do they have one now? Is there a problem? Are there more drugs in Rosebud County than there were before? Have the construction workers brought in more drugs for those people who have lived there all their life, and they're chaning their lifestyle that way, that you know of?

A Not explicitly.

Q Well, why do they have that added to their curriculum then? Is that another of the superintendent's gut reactions?

A That in part, but I think you have to place that in perspective in how many other schools in the state or in the country have similar programs that have been put into effect.

Q Do you know how many schools in Montana don't have that in their curriculum, poor little country schools and little country places that represent the lifestyle of Montana that have never had that and still don't have it? Did you do a study on that?

A No, sir.

Q You never looked at the curriculums of Montana schools, did you?

A No, sir.

Q You didn't even talk to the State Superintendent of Schools about curriculums or what she or how she rates these schools and their people and their students' participation. You didn't do that, did you?

A No.

Q And you don't know that all of what they added, whether it was necessary or whether it was beneficial, either, do you?

A That's correct.

MR. BELLINGHAM: Sir, how long do you intend to go on before we stop for the night?

HEARINGS EXAMINER: We'll stop any time that they want to. Do you want to recess now and start again in the morning? I didn't know how long you intended to go. We might as well, do you think?

MR. CUMMINS: I think that I could finish in about 15 or 20 minutes.

HEARINGS EXAMINER: Well, that's quite awhile. We will recess until 8:30 in the morning.

(RECESS AT 5:23 P.M.)

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